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Vol. V

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TRANSCRIPT OF RECORD

Supreme Court of the United States

OCTOBER TERM, 1942

No. 246

CHARLES CORYELL, ET AL., PETITIONERS,

vs.

JOHN S. PHIPPS AND GEORGE J. PILKINGTON

**ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT
OF APPEALS FOR THE FIFTH CIRCUIT**

PETITION FOR CERTIORARI FILED JULY 20, 1942.

CERTIORARI GRANTED OCTOBER 12, 1942.

VOLUME V.
TRANSCRIPT OF RECORD

UNITED STATES
CIRCUIT COURT OF APPEALS
FIFTH CIRCUIT.

No. 10185

CHARLES CORYELL, ET AL.,
Appellants,
versus

JOHN S. PHIPPS and GEORGE J. PILKINGTON,
Appellees.

**Appeal from the District Court of the United States for
the Southern District of Florida.**

(ORIGINAL RECORD RECEIVED DEC. 17/41.)

Mr. Matteson:

The testimony is that those that have examined the ship, have not been able to find any evidence that there was any such thing; while there has been evidence of other braces.

Mr. Underwood:

The ship has been through a fire.

Mr. Matteson:

And Mr. Underwood's witnesses have testified that there was no fire, to speak of, in the tank compartment, at least in the lower part.

The Court:

Read the question.

(The last question was read by the reporter.)

Mr. Matteson:

The question as to whether there was such bracing, or not, may be a fact that you will have to determine, from the evidence or otherwise; but I think I am entitled to ask the question, on that assumption, so the opinion will be here.

The Court:

You mean, Mr. Matteson, that there is a theory as to which that hypothesis could be sustained?

Mr. Matteson:

Yes.

The Court:

And with that, you are entitled to an opinion on that hypothesis?

Mr. Matteson:

• Yes.

The Court:

I think that is reasonable; overrule the objection. Just generally speaking, I call your attention to this; as the examination is going on, I am endeavoring to require the proponent of questions to incorporate to his witness, hypotheses which call for an answer. On cross examination I have now adopted a different rule, as you probably have noticed. On cross examination I think a witness who is being examined should call attention to any missing element which he thinks should be incorporated.—You may answer the question.

A. If there were no braces between the bulkhead and Number One tank, no such bulkhead on Number Four tank, those tanks would be unstable if the vessel was rolling. In other words, if they weren't there, they should be.

Q. Now Captain, it has been suggested here that the fact that condensation might accumulate at the bottom of the Seminole's gasoline tanks, in V-shaped sections around the inverted bottom, which if it occurred would form a protecting seal of water which would protect the tank against corrosion. In your opinion is that so?

A. In my opinion, if they didn't get water in there in the first place, you wouldn't have corrosion.

Q. Do you think the presence of the water would be any protection against corrosion?

A. Well you would protect it this way; if there was corrosion there,—some water in there, exposed to the atmosphere, you would increase the corrosion.

Q. Now it has been suggested, Captain, that these tanks as constructed, and as you have observed them on the Seminole, in their new condition, would be good for a hundred years, or for at least a period beyond the life of the vessel. What is your opinion with respect to that?

A. I don't agree with that.

Q. What has been your experience with respect to galvanized tanks?

A. Well I have seen the galvanized tanks of that type, start leaking in seven and eight years; might get fifteen years out of them, might get twenty, according to the thickness, the care that they had. I have inspected manifolds of galvanized tanks, also copper tanks, that I found leaking; but the copper tanks leaking, that was due to fittings letting go, and solder; and on galvanized it is usually due to rust.

Q. Have you had any experience that would indicate the extent to which galvanized iron tanks, due to the gasoline, corroded?

A. Well, the houseboat Fortuna, for example, I inspected her, found three of the gasoline tanks rusted through; one of them had a hole you could put a derby hat through the bottom.

Q. How large was it?

A. As I recall it, it was two-foot in diameter by seven-foot long.

Q. What sort of a hole did you say you found in those tanks?

A. Along the bottom you could almost put a derby hat through the bottom; rusted and corroded away; that is in the one tank. There were two other tanks leaking. I recommended they renew all of them.

Mr. Underwood:

I object to what he recommended.

(By Mr. Matteson):

Q. When was it that you made that observation?

A. About two years ago.

Q. That would be in 1937?

A. Yes, sir.

Q. Did you make a survey of the Fortuna at that time?

A. Yes, sir.

Q. Will you tell me whether she had pans under her gasoline tanks?

A. Those gasoline tanks were in a lead lined box.

Q. What do you mean by that, Captain? Describe it to us.

A. Well it was a very large box, and lead lined; there was a lead that went from the box, that was down in the bilge, underneath the cabin floor.

The Court:

Do you want a ruling on that,—what he recommended? Or, are you satisfied to let it go as it is?

Mr. Matteson:

I am willing to have that stricken out.

The Court:

All right.

Q. With respect to the tanks that you observed on the Fortuna, were there any access plates on those tanks?

A. Examination plates?

Q. Yes.

A. Two on each tank.

Q. That is all.—Oh, may I ask this one other question; Captain, you have expressed various opinions on different things in the course of your examination, as part of the Libelants' case last spring. In view of anything that has transpired since, have you changed those views?

Mr. Underwood:

I object to that question, your Honor.

The Court:

It is pretty general.

Mr. Matteson:

Well if your Honor please, I simply—it is a very general question, I realize that. I don't want to extend the examination of this witness unduly; I just wanted to make it perfectly clear that he hasn't reneged on anything, that his testimony still stands without changes.

The Court:

Well I think there is a presumption that, once of one opinion, he remains that way.

Mr. Matteson:

All right.

Mr. Underwood:

Mr. Botts, have you any questions?

Mr. Botts:

I don't think so.

Mr. Underwood:

You are entitled to go first, you know.

Mr. Botts:

I will say this, that I may want to put him on with reference to a certain matter; but I didn't know he was going on this morning, and I don't know whether he has any information on the subject; and I am not going on a fishing expedition until I find out whether he is informed on the question.

Mr. Underwood:

It is the hunting season that starts Monday, not the fishing season.

Cross Examination.

By Mr. Underwood:

Q. Captain Patton, were there any pans of any kind under the tanks on the Seminole?

A. Two pans.

Q. And they had rectangular angles at the outboard ends?

A. I think so.

Q. Rounded corners?

The Court:

As I understand it, so far as on the general line of interrogation now, Fred, you didn't want to ask him any questions?

Mr. Botts:

When the witness is through I want to speak to him and ask him—

The Court:

About another particular matter you had in mind?

Mr. Botts:

It is not concerning the matter he has been interrogated about this morning, at all.

The Court:

We did adopt that general rule and I thought we would follow that at this time; but of course I realize it is something else you have in mind, that you want to interrogate him before you did put him on as your witness.

Mr. Botts:

Yes, sir; it will take about a minute, either way.

Mr. Underwood:

Will you read the last question please?

(The testimony last preceding, was read.)

A. I believe they were.

Q. And Number One and Number Two tanks sat in one pan?

A. Yes.

Q. And Number Three and Number Four tanks sat in the other?

A. Yes.

Q. Is that right?

A. That is right.

Q. And the pans were bigger than the two tanks, of course?

A. Yes.

Q. So that there was a margin of pan all around the tanks, was there not?

A. Yes; that is, the lid came up.

Q. Did you observe whether those pans had been broken down or destroyed in any way?

A. Not that I could see.

Q. So that the tanks sat entirely within the pans, is that right?

A. No, the tanks sat on the wooden framework, which sat in the pans.

Q. But the tanks didn't extend beyond the margin of the pan at all?

A. No.

Q. That would leave the tanks several inches within the margin of the pans, is that right?

A. I don't know the exact distance, but they were inside of the lid of the pan.

Q. So if you were down below looking up, you couldn't see any of the bottoms the tanks, could you?

A. I don't think you could.

Q. Well it is clear that you couldn't, isn't it?

A. Yes.

Q. Now Captain I want to read you a question and answer that was put to you before, on Page 841: "Q. Could the tanks be inspected from underneath?" "A. I looked in there and it appeared to me to be metal on top of angle irons, but you could see pretty clearly all the bottom of Number One tank. I just looked in there out of curiosity, at that time." —Now is it true or is it not true?

A. It is not true.

Q. —that you could see the bottom of Number One tank?

A. No.

Q. Is it true—

A. I thought it was the tank, at the time, but I stand corrected on that.

Q. How do you account for the fact that you said that you "Could see pretty clearly all the bottom of Number One tank"?

A. Well I twisted my neck up there, and could tap it, and found it was metal; I assumed it was the bottom of the tank.

Q. Do you mean to tell me that you can't tell the difference between a pan that is as big or bigger than two of those tanks, and the bottom of the tank itself?

A. Yes, if I had a flashlight and went underneath there.

Q. You didn't have a flashlight?

A. No.

Q. And you didn't go underneath?

A. No, I just looked up and tapped it and found it was iron, and assumed that was the bottom of the tank.

Q. What shape was the bottom of this pan, Captain?

A. Well, oblong.

Q. Well, the bottom was flat, wasn't it?

A. Yes.

Q. But the bottoms of the tanks weren't flat, were they?

A. No, they were not.

Q. And you testified before that they were not flat, but concave, didn't you? Now how did you know they were concave bottom tanks if you looked under there and could see nothing but the pans?

A. Well in the engineroom you could see down in the pan and see the row of rivets; so it must be a concave bottom.

Q. You now say that you could not see the bottoms of those tanks at that time?

A. Not at that time, no, sir. What I assumed was the bottom of the tank, was the sheet iron, the pan.

Q. And you couldn't see the concave bottom?

A. Not at that time, no; not until you pulled one out.

Q. Well now Captain I refer you to another question and answer, on Page 861, of your previous testimony: "Q. This hole in Number Two tank, what was that?" "A. When I looked in there I could see what appeared to be metal under the tanks, all of the tanks, excepting a portion under Number Two tank, where you could look up and see the concave part of the tank." Is that true?

A. In the dusk I thought it was; in that darkness.

Q. This was dusk, now?

A. Well it is dark underneath that tank.

Q. And you had no flashlight?

A. No, at the time I had no flashlight.

Q. Well you didn't say, at the time when you were previously questioned, that you thought you could see the concave bottom, did you?

A. I know it was a concave bottom, and I thought was the bottom that was showing.

Q. Well now Captain, are you so inexperienced that you can't tell the difference between a flat bottom of a pan and the concave bottom of a tank?

A. I didn't go under there and examine it; you need overalls and a diving suit to get under there,—and a flashlight.

Q. Was your examination of the rest of the boat, of a similar kind?

A. Not where I could see it plain.

Q. You weren't entirely frank with us about that on your previous testimony, were you, Captain?

A. About the bottom of the tank?

Q. Yes.

A. I didn't think it amounted to much.

Q. I see, your testimony is frank or not frank, depending upon how important you think the matter is; is that correct?

A. In a way, yes, sir,—on the tank.

Q. Oh, you limit it to the tanks, do you?

A. Yes, the tanks alone.

Q. Nothing else, of course?

A. My testimony is correct; but I didn't pay much attention to the tanks, I admit that.

Q. But you didn't tell us that before, did you, Captain?

A. I wasn't asked. Had I authority to go up there and—

Q. You did stick your head in the space underneath the tanks and pans, didn't you, Captain?

A. I got down as far as I could without getting all messed up, and looked up.

Q. Well now Captain, that doesn't quite answer my question. Did you or did you not stick your head under the space below, in the space below the tanks and the pans?

A. Yes, as far as I could without getting dirty.

Q. Well now you know what your head is?

A. I think so.

Q. You know what this space under the tanks and pans, is? Is that right?

A. Yes.

Q. Did you or did you not put your head in that space under the pans and the tanks?

A. Yes, I stooped down and looked up. You mean, the framework where the tanks were?

Q. I want an answer to this specific question which I have put to you three times. Did you or did you not put your head under the tanks and the pans in that open space below?

A. Yes, I went down and looked,—from down below, up.

Q. And you saw nothing that you recognized, that you recognized as a drip pan?

A. No.

Q. Or, a pan of any kind?

A. No one knew much about the drip pans at the bottom of the tanks until you took Number Four out.

Mr. Underwood:

I move to strike that out, as not responsive.

Mr. Botts:

I think it illustrates the situation, if the Court please.

Mr. Underwood:

It certainly doesn't, Judge; because my witnesses testified to there being drip pans under the tanks, before Number Four tank was taken out. These people have just been caught out of bounds, that is all. They have said there were no pans; and I have demonstrated beyond any possible doubt that there were pans; they are there today. He says nobody knows.

The Court:

I think that motion to strike is proper; granted,—that portion of the testimony, what no one knew.

Mr. Underwood:

That is what I refer to.

Q. Now Captain, in your examination in May, 1939, did you obtain anybody's permission to go aboard the Seminole?

A. Yes.

Q. Whose?

A. Louis Nuta's. I asked him if I could go aboard, and he said, "Help yourself".

Q. You are quite clear about that?

A. Positive.

Q. You know who Louis is?

A. Oh, yes, I know who Louis is.

Q. Couldn't be any mistake about it being somebody else?

A. Only one Louis Nuta.

Q. Did you measure the height of the ash that remained in the tank compartment around Numbers One, Two and Three Tanks?

A. No, sir.

Q. Was it approximately 20 inches?

A. I couldn't say.

Q. You don't know?

A. No.

Q. What is the process of galvanizing a tank after it is manufactured?

A. After the tank is all built?

Q. Do you understand what I mean when I say, after it is manufactured?

A. Yes.

Q. That means, after it is manufactured?

A. Yes. They pickle a tank, to make the plating clean, and then there is a hot bath.

Q. First they dip it in acid and clean the plates, is that right?

A. That is what they call it, a pickle.

Q. And they take it out of that, is that right?

A. Yes.

Q. And then they dip it again in something else, is that right?

A. I have only seen them dip it once, in acid.

Q. You have never seen them dipped in anything else but the acid?

A. Dip in the zinc,—the galvanizing.

Q. First they dip it in acid?

A. Well it is a pickling bath.

Q. Then they dip it in something else?

A. Yes.

Q. What is that something else?

A. It is mostly zinc.

Q. What else is it?

A. I couldn't say; it is a galvanizing, that's all I know.

Q. Well what are the constituents of that material they dip it in?

A. I believe it is mostly zinc.

Q. What is the rest of it?

A. I couldn't say.

Q. Don't know?

A. No.

Q. A man of your experience, you don't know that?

A. I am not a galvanizer,—though I have seen lots of it done.

Q. You are a pipefitter, are you?

A. Yes, I am a pretty good pipefitter, too.

Q. What is the effect of that dipping in that zinc—and other things that you don't know? It adheres to the tank, is that right?

A. You have reference to the pickling, first?

Q. No, we are past the pickling now, and I don't want to talk about that any more.

A. Dipping it in the zinc puts a layer of what they call galvanizing.

Q. Over the whole tank?

A. Over the whole tank. They also use a spray method too, now.

Q. Do you know at what temperature zinc melts?

A. I can look it up in the book; I don't keep all those melting temperatures in my head.

Q. That is what the reference books are for, isn't it?

A. That is right.

Q. Suppose you do look it up. I think Mr. Matteson has a copy of Kents'; will you do that?

A. It is a low temperature.

Q. Do you want to approximate it, and let us look it up later on?

A. No, I would sooner you would look it up in the book; that's what I would do if I wanted to know.

Q. Captain, I suppose you have seen rivets burned out of various kinds of steel, plating, haven't you?

A. Yes, sir.

Q. The process is to take an acetylene torch, put it in the middle of the rivet head; it burns right through in a minute, doesn't it?

A. Very shortly, depending on the size of the rivet.

Q. The process wouldn't leave any chisel marks, would it?

A. No, if she didn't blow up with it.

Q. You have seen that process used on tankers, haven't you, Captain?

A. Not without the tanks were thoroughly cleaned out and passed by chemical test.

Q. But you have seen it used on tankers, haven't you?

A. Yes, many.

Q. Of course if you were burning out the rivets in the bottom seam of the Seminole's tanks, you would not be burning into any gas filled chamber, would you?—you can answer that yes or no, can't you Captain? You wouldn't be burning into the tank, would you?

A. No, but you would be heating the metal.

Q. But you wouldn't be burning into the tank, would you?

A. Not into the body of the tank, no; that is on the bottom row.

Q. Yes, that is what we are talking about, the bottom row. How far down do you say the side plating of the Seminole is double plated now?

A. I can't say. I did look at the strake by the window.

Q. That is the first strake?

A. Yes.

Q. The first row of plates, counting down from the top?

A. From the window, yes. That is the only one I examined. No doubt she has got more in her, but I didn't see.

Mr. Underwood:

I move to strike out from "—No doubt", onward.

The Court:

I think that is proper.

Q. Did you ever operate any engines of the size of those in the Seminole?—any Winton engines like those?

A. Personally operate them? No. I am familiar with them, though.

Mr. Underwood:

I move to strike out the latter part of the answer, as not responsive.

Mr. Matteson:

What was the latter part of the answer?

(The second sentence of the last answer was read by the reporter.)

Mr. Matteson:

I think that is perfectly proper.

Mr. Underwood:

If your Honor please, I asked him the straight and simple question about whether he had ever operated them.

The Court:

That is true, but I don't think the voluntary statement is objectionable; I deny the motion to strike.

Mr. Underwood:

Can we agree that the melting point of zinc is 787 degrees Fahrenheit?

Mr. Matteson:

Yes.

(By Mr. Underwood):

Q. Captain, you spoke of the possibility of using a pump on the feed manifold system, to run gas up on deck; do you remember that?

A. Transfer pump.

Q. Well you would have a fitting where the line lead from the feed manifold to the pump, wouldn't you?

A. Union.

Q. And you would have, even if you used copper tubing, you would have another fitting—

A. I would use iron.

Q. Iron pipe?

A. Yes, the same as your manifold size, if you wanted to get a stream of gasoline.

Q. Iron pipe, not brass?

A. That is not a feed line.

Q. You wouldn't use brass pipe on that?

A. No.

Q. Why not?

A. Well you are just continuing this iron pipe; you might continue with the same size and material.

Q. Is it your understanding that the feed line on the Seminole was made up of iron pipe?

A. No, brass. I am speaking about this here; if you put a transfer pump from this line up on deck.

Q. But Captain, you are indicating the—

A. This iron pipe.

Q. You are indicating the valve marked Crane 150?

A. No, I am speaking about this iron pipe in here.

Q. But you are speaking about—

A. Dispense with all this hazard, and hook your transfer pump on this fitting. I have recommended that on several jobs, and it works very satisfactorily.

Q. Then you would have another connection where the pipe came in contact with the pump, wouldn't you?

A. Yes.

Q. And you would have various connections in the pump?

A. Just the inlet and discharge.

Q. Those would be the only two places where a pump could possibly leak?

A. No; you have a stuffing box there.

Q. You would have to manage to keep that tight, wouldn't you?

A. Sure; keep everything tight in an engineroom.

Q. Any other place where the pump might leak?

A. No, just the one stuffing box; that is assuming that your gaskets were put in properly.

Q. Then you have your riser from the pump?

A. Going up through the deck.

Mr. Underwood:

I think that's all.

Mr. Botts:

Judge, if you suspend a minute, so I might confer with this witness, I might have one or two questions.

(A brief informal recess was held.)

By Mr. Botts:

Q. Captain Patton, you have testified that you arrived at the scene of the fire while the conflagration was still in progress, and remained there almost continually until the body of Mr. Abel was recovered?

Mr. Underwood:

I dislike to interrupt, but is this Captain Patton called as a witness for Pilkington?

Mr. Botts:

I don't know, he is just here. You can put it down any way you want to, making him mine or anybody else's.

Mr. Underwood:

Anybody else but mine. I think we ought to have it clear whose witness he is, though.

The Court:

Mr. Botts is calling him, so he will be regarded as a witness for Pilkington.

(The last question was read by the reporter.)

A. Yes, sir.

By Mr. Botts:

Q. Do you recall the occasion when the Seminole and surrounding cooled down so it was possible for someone to go aboard her?

A. Yes, sir.

Q. And do you recall whether you were with the first people that went aboard the Seminole after she became cooled off enough?

A. Yes, sir, if not the first; I am not sure; I was there all the time.

Q. You were there at the time, and were among the first?

A. Yes, sir.

Q. I will ask you, at that time, if you observed the position of the tanks of the Seminole?

A. Yes, sir, I did.

Q. Did you observe the position of the tanks of the Seminole on the occasion when the Court and counsel visited the Seminole at Nuta's Boat Yard in October, I believe it was, of this year?

A. Yes, sir.

Q. I will ask you whether you can state from your observation on this occasion of your first visit to the Seminole, after the fire, and the visit out there at Nuta's Boat Yard, whether, save for the tank that had been removed, the position of the gasoline tanks in the Seminole was the same on those two occasions?

A. Yes, sir, as far as I could see.

Q. Well now I ask you whether you observed?

A. I did; yes, I looked at them.

Q. And was the position the same?

A. Yes, sir.

Q. I call your attention to a photograph—these are all in evidence?

Mr. Matteson:

I don't think it is.

(By Mr. Botts):

Q. I call your attention to a photograph—

The Court:

Mention it.

Q. It isn't in evidence; and ask you if you took that photograph?

A. Yes, sir.

Q. Does that photograph correctly exhibit the condition and location of the tanks of the Seminole upon your visit immediately after the Seminole had cooled down—that is, your first visit?

A. Yes, sir.

Mr. Botts:

We offer it in evidence.

Mr. Underwood:

I take it by your testimony, Captain, you mean that this photograph correctly represents the position and condition of the tanks when the photograph was taken, August 13, 1935; is that what you mean?

A. Yes, sir; they hadn't been moved any.

Mr. Underwood:

I move to strike out, they hadn't been moved any.

Mr. Botts:

If he knows it, he can state.

Mr. Underwood:

I have the right to cross examine about it at the moment. This was taken August 13, 1935?

A. Yes, sir.

Mr. Underwood:

And the tank in the foreground is the starboard tank?

A. I think it is the port tank. Have you got any more of those others?

Mr. Underwood:

The tank at the bottom of the photograph is the port tank?

A. I believe so, yes.

Mr. Underwood:

Number One tank, is that right?

A. Yes, that's right. There is that mass of hyacinths over there.

Mr. Underwood:

I have no objection to the photograph.

(By Mr. Botts):

Q. And you say this was taken on August 13th, and correctly exhibits the condition immediately after the fire?

A. Yes, sir.

The Court:

That makes it unnecessary for the Court to rule on your motion to strike.

Mr. Underwood:

Quite so.—What will that number be?

(The photograph so tendered was admitted in evidence and filed as Respondent Pilkington's Exhibit 16.)

(By Mr. Botts):

Q. When you visited the Seminole the first time, after the fire, I will ask you if you observed any evidence of

an explosion having occurred; and if so, just answer, did you observe any such evidence?

A. Yes, sir.

Q. Now then with respect to the tank compartment, did you observe any particular evidence of an explosion in connection with the tank compartment?

A. Yes, sir; the bulkheads were pushed,—separated; pushed up.

Q. You mean, pushed away from the tanks?

A. That is right.

Q. So that the walls of the tank compartment had—

A. Expanded.

Q. Bellied out?

A. That is right.

Mr. Botts:

That's all.

By Mr. Underwood:

Q. When you say, bellied out, do you mean that the fair shape of a flat plate, had been changed, or that the two bulkheads were just further apart at the top than they were at the bottom?

A. That is right.

Q. The latter?

A. The latter, yes, sir. The bulkheads were bellied out, including the plating too.

Q. And that's the only evidence you saw of an explosion in the tank compartment?

A. Except for the tanks being misplaced. There must have been an explosion there to push them out of place.

Q. How many tanks were misplaced?

A. One that I know of.

Q. And only one that you know of, is that right?

A. I would have to take—

Q. Is that right?

A. I wouldn't admit but what the others were slightly misplaced; but there was one—

Q. All I want to know is this, Captain; do you say that they were or do you say that they weren't?

A. They were.

Q. The others were misplaced?

A. One, to a great extent; I don't know about the others; I didn't put a line on them.

Q. Let's take them up one at a time. In the first place, you got there on the afternoon of the fire, after the Fire Department had gone; is that right?

A. That's right.

Q. And you say the first time you saw the tanks, Number One was misplaced,—out of place; is that right?

A. Yes.—No, Number Two tank was out of place.

Q. How about Number One?

A. Well, comparing Number Two with Number One and Three, Number Two was greatly out of place. I didn't line up all the rest of them.

Q. Did you run a line on any of them?

A. No, I did not. But I run my eye and could see that Number Two was well out of place.

Q. You are sure about that?

A. Pretty sure; it is a long time ago.

Q. You are sure aren't sure, Captain; please tell me what it is.

A. I wouldn't trust my memory; I would trust to the photograph.

Q. I can read photographs with some degree of accuracy; I want your memory. What is it, now?

A. Four years and a half is a long time to remember those details.

Q. Yes, and I appreciate you may be uncertain about a lot of things. Now what is your memory on that?

A. My memory would say, Number Two.

Q. And that Number One was not misplaced?

A. I wouldn't swear to that.

Q. Captain, you really don't know which is which, at this time, do you?

A. I will depend on the photograph.

Q. Well, Captain, I think it is fair to say to you that the Court is going to depend in some measure on the photographs, too; but we would like—I at least would like to have your memory.

A. I will say at least one tank was misplaced.

Q. Which one?

A. I think that was Number Two.

Q. Well we have got two things which you say are evidence of an explosion: One is the bulkheads, and the other is Number Two tank. Is there anything else?

A. No, except hearsay, and I can't quote that.

Q. That is right. What was it that indicated to you that this particular tank was out of place?

A. They didn't line up.

Q. At what point? Are you referring to the place where the valve came through the hole, or at the top or where?

A. No, that shows that it is Number Two tank; the draw-off valve, at the base of the tank, near the base of the tank, is centered in the hole in the bulkhead, and the other three are nearly so, but it is very much out; in fact it was sheared off, that valve, Number Two.

Q. Well did you observe that on the day after the fire?

A. No, two days afterwards. We were busy pumping her out, trying to get Captain Thomas' body.

Q. This observation refers to June 27 then?

A. Two days after the fire.

Q. The second day after the fire?

A. I believe so. The diver tried to get them the following day but couldn't find them; we had to pump her out.

Mr. Underwood:

That is all.

Mr. Botts:

That is all.

Mr. Matteson:

That is all I have.

The Court:

Captain let me ask you this question; maybe it is very academic; but assuming that there was a spark from the knife switch.

A. Yes, sir.

The Court:

The position of which in the engineroom was considerably above the engineroom floor; and assuming that there was gasoline vapor confined solely to the bilge of the boat; could that spark have been communicated to the gaseous substance in the bilge?

A. Yes, sir; it has been proven by the laboratory of the New York Fire Department—

Mr. Underwood:

If your Honor please, I hesitate to interrupt.

The Witness:

Isn't this off the record?

The Court:

I just want your idea.

The Witness:

Is this going in?

Mr. Matteson:

Yes, sir.

A. Yes, sir. With the strong gasoline fumes in a bilge, it might be too strong to ignite; but with that mixture of air, and him passing around through there, very probable that he started up the proper mixture, that sparking of a switch made the explosion. That was my opinion, two days afterwards, when I was able to investigate it. If I live to be a hundred years old I will always think that is what started it.

The Court:

You spoke of a possibility of there being gaseous substance in pockets in the bilge?

A. Yes, sir; I mean by that, many boats have web frame, intercostals, which form pockets down below decks.

The Court:

Assuming that the gaseous substance was confined to the pockets and had not been disseminated in the atmosphere, or the air, to which the spark could have had access, that is horizontally in contact with the atmosphere at that point; if the gaseous substance was confined to pockets in the bilge, could there have been any contact between this spark and the gaseous substance in the bilge -- in the pocket in the bilge?

A. I don't know as I can explain that, but to my mind the denser gasoline vapors would be against the skin of the ship, and gradually decrease in density, to the top of the engineroom.

The Court:

Well do you assume then that on the theory that gas is heavier than air, and it had in the first place descended to the bottom-most part of either the bilge or the engineroom, to which it had access; is that a correct assumption, according to your ideas now?

A. My idea is that the bilge was full of a strong gasoline mixture, and so was the engineroom.

The Court:.

Well let me ask you this; assuming that there was some opening through which gaseous substance could pass from the engineroom to the bilge, would, according to your ideas, and your teaching and learning on this matter of gaseous substance, and where it would locate,—would that gaseous substance go to the bilge and remain in the bilge, to the point that it would not remain in the engineroom?

A. The denser part of it would, your Honor. Gas can only get so dense until it liquefies; and I am of the opinion there was enough gasoline in the entire bilge of that Seminole, that the whole engineroom was a strong gasoline mixture.

The Court:

Well I am speaking about it now from the theoretical standpoint.

A. Well now, I don't know whether this should go in the record, but the night Mr. Botts and Miller and I went up to the hospital—

Mr. Underwood:

I am sorry, I will have to object to that.

The Court:

Don't get into hearsay.

A. I was an eye-witness.

The Court:

That is all right; I want your views from the theoretical standpoint.

A. I believe the whole engineroom—

The Court:

I am not asking you what your views are as to this particular case; I am asking you, from the theoretical

standpoint; that is all I am interested in now; I mean, from any questions to you,—just theory.

A. Have I answered that sufficient?

The Court:

Yes. Would the fact that according to your theory, now, that there could be a denser solution in the bilge, than from a higher portion, to wit, in the engineroom—

A. Yes, sir; you might have—

The Court:

In theory, would that be necessarily brought about by some circulation of air, or some outside influence, that would have brought about that rising of a portion of the more dense solution at the base, to wit, in the bilge, higher in the engineroom?

A. Yes, sir, that is quite right; that boat, even under a shed, in my opinion is insufficient ventilation. I admit that there was some ventilation, if you were to stir that up.

The Court:

I caution you, please, in answering my questions,—I am dealing in my questions to you, from a theoretical standpoint. We have had testimony here based upon hypotheses that there was no circulation. What I am interested in asking you about is, assuming that from a theoretical standpoint it was airtight,—assuming an airtight situation.

A. Then I believe the gas—

The Court:

Then would the dense solution at the base of the compartment, or apartment, wherever gas was confined, would it remain as dense solution until the volume of it had increased to the extent that the space occupied by the dense solution would naturally be increased?

A. Yes, sir, I believe it would.

The Court:

Well I gather then from your answer to my theoretical question, that, assuming that there was no outside influence in the way of circulation of air or heat or convection, or whatever it may be called,—nothing of an outside influence; if there was a denser solution at the base of the apartment or compartment, more so than there was at a higher point in the compartment, it would necessarily be brought about by some outside influence?

A. Yes, sir.

The Court:

Now—

Q. What you mean, your Honor, is some outside influence would have to stir up the thick stuff?

The Court:

That is right.

A. Either mechanical force or ventilation, or draft, or something—yes, sir, that is quite right.

The Court:

Well now is this correct; can you dissociate in your mind the mental picture of the engineroom and the bilge of the Seminole as you have it pictured, as it must have been at the time of the fire, or conflagration, or whatever it was started; but picturing that it was a boat, as distinguished from that particular boat; that it was a vessel, with an engineroom, and with a bilge, and with tanks in which gasoline was kept, in which there was a knife switch. Now from a theoretical standpoint, am I correct in this: that if a spark was emitted from the knife switch on the wall of such a theoretical boat, that either one of these two situations must have existed. That either the gaseous substance which in the first place was heavy enough to descend to the bottom of the available

space,—that either that gaseous substance in its density had increased in volume to the extent that it had arisen to the point even or in proximity to the knife switch; or else that there was a lessening of the density at the bottom, which lessened density had counteracted and gone into the upper portion of the apartment of the boat,—of the vessel, and that therefore according to what you have stated as to outside influences, that there must have been some method of outside influence to have brought about that situation? Now is that a fact?

A. Do you want me to give my opinion?

The Court:

Yes; it seems to me that that is—

A. Either could cause it.

The Court:

Sir?

A. I believe either way, as you describe it, could cause an explosion.

The Court:

Well my thought is that one or the other must have done it. Now am I correct in that?

A. Yes, sir; I am inclined to think that the first thing happened.

The Court:

I am not asking you, Captain, which in your opinion did happen; I am asking you, from a theoretical standpoint, is it a fact that one of those conditions must have existed?

A. Yes, sir, that is quite right.

The Court:

Now to go over that again; either the dense solution must have increased in volume sufficiently to have ele-

vated in the open apartment, to have occupied continually more space as its volume increased?

A. And richer.

The Court:

And richer; or else if it was a fact, in this theoretical case, that was a more dense solution at the base, as compared with a like solution at the top,—that that condition, of a more dense situation at the bottom, compared with the lighter solution at the top, was brought about by some outside influence?

A. Yes, sir.

The Court:

That is all I care to ask.

By Mr. Botts:

Q. In other words, as I understand it, Captain, if the air in the surface,—I mean in the bilge of this—and not the Seminole; but of any vessel, any boat, if it remained calm and stationary, without motion, then the heavier gas—

A. You said, air, Mr. Botts?

Q. All right, if the contents of the vessel was not being agitated in any way, whether it was gas or air, and there was in that an explosive mixture of gasoline and air, when it rose to the point equal to the knife switch, if the knife switch emitted a spark, it would explode?

A. Correct.

Q. So as I understand it, if there was this explosive mixture down in the—

A. Bilge.

Q. In the bilge of the vessel, and had risen to a constant level—

A. In other words, built up.

Q. Equal with that of the knife switch; that some current of air might have caused a swirl of air to come up and explode it, is that correct?

A. That's right.

Mr. Botts:

That is all.

By Mr. Underwood:

Q. Captain Patton, Mr. Matteson has said that I might use these photographs of his. Is that one that you took?

A. Yes, I took that.

Q. You took it on July 31, 1935?

A. That's right.

Q. And it is a photograph of the draw-off valve?

A. That's the same.

Q. I show you another one; did you take that?

A. Yes, sir.

Q. July 31, 1935?

A. That's right.

Q. And that's a photograph—

A. Of these fittings down here.

Q. Two of these fittings?

A. Do you want a copy of these?

Q. No, not these, it is the other. Where did you take these photographs, Captain?

A. This is an old bedspread hanging on to the side of my car, or the window of the car. That was in Coral Gables it was taken.

Q. These were taken out in Coral Gables?

A. Yes.

Q. At your house?

A. Yes, sir.

Q. Did you just get the fittings out of your house and hang them up on the back of your car?

A. I didn't get them out of the house.

Q. Where did you get them?

A. Let's see; I think I got them from Mr. Miller.

Q. Gary Miller? You mean you got them from him just before you took them?

A. Yes, sir, shortly.

Q. Within a day or two?

A. Yes; I didn't keep them out there, I didn't want them.

Q. I just want to get it straight, Captain. You got these contrivances that are shown in these two photographs, a day or two before July 31, 1935, from Mr. Gary Miller of Fort Lauderdale?

A. I believe that's right, yes, sir.

Mr. Underwood:

I offer those two exhibits.

Mr. Botts:

No objection so far as I am concerned.

Mr. Matteson:

No objection.

The Court:

They will be admitted.

Mr. Underwood:

The first one is a photograph of Exhibit 11.

(The said photograph was admitted in evidence and filed as Respondents' Exhibit 5-T.)

Mr. Underwood:

The next is a photograph of Exhibits Numbers 2 and 17.

(The said photograph was admitted in evidence and filed as Respondents' Exhibit 5-U.)

Mr. Underwood:

I have no more questions.

Mr. Matteson:

That is all.

(Witness excused.)

Mr. Botts:

Before I forget it, I would like to offer in evidence these two exhibits that have been marked 13 and 14 for identification, and concerning which the stipulation with reference to testimony was offered yesterday. Any objection to these, Mr. Underwood? I am just offering these in evidence now that we have that stipulation yesterday afternoon; 13 and 14 in evidence, instead of for identification.

(The said two exhibits were admitted in evidence and filed as Pilkington's Exhibit Numbers 13 and 14, in evidence, respectively.)

3983 Thereupon EDWARD S. THIBAULT as a witness on behalf of Libelants' in rebuttal, was sworn, and testified as follows:

Direct Examination.

By Mr. Matteson:

Q. What is your full name?

A. Edward S. Thibault.

Q. Where do you live?

A. Miami.

Q. And how long have you lived here?

A. Since '22.

Q. What is your business, Mr. Thibault?

A. Ship builder.

Q. In 1927, where were you employed?

A. I was superintendent of Merrill-Stevens Dry Dock Company.

Q. Have you lived here continuously since that time?

A. Yes.

Q. As superintendent of Merrill-Stevens shipyard at that time, what was your duty,—what were your duties?

A. Why I run the yard; in every capacity except the office; in charge of all construction.

Q. Repair work?

A. Repair work.

Q. Do you recall the yacht Seminole?

A. Yes.

Q. Being at the Merrill-Stevens yard, the latter part of 1927?

A. Yes.

Q. Was she also there earlier in the year, do you remember?

A. Yes, in the spring—some time in the spring.

Q. Now particularly with reference to the work that was done the latter part of the year, can you tell us what the nature of that work was?

A. Renewing shell plating, bottom shell plating, side shell plating.

Q. At that time—who was in charge of the work on the Seminole?

A. I was in direct charge, with the foremen of the different classes of work.

Q. Mr. Thibault, in connection with that work that was done at your yard, were the gasoline tanks removed from the Seminole at any time?

A. No.

Q. Was any work done on the gasoline tanks of the Seminole?

A. I don't think so.

Q. Was the side plating removed from the ship?

A. No, sir.

Q. You spoke of renewing bottom plating. What part of the ship were the bottom plating renewed?*

A. When we started out, we started to remove the bottom plating on the after end of the ship, under the engineroom and back there; and when we got out we found we had to renew practically the whole bottom.

Q. Afterwards there was some done in the forward part of the too, you say?

A. Oh yes.

Q. Were the floor frames,—were the floors and frames under the engineroom and the tank compartment forward of the engineroom, removed at any time?

A. Why forward of the engineroom,—forward of the main window, where the water tanks was, we did renew some pieces of frames; but not in the after part of the boat at all.

Q. Was any work of that character done in the space under the tank compartment, or in the engineroom?

A. No.

Q. What was done with respect to the side plating of the Seminole?

A. Why we originally was going to renew the guard irons, some of the guard bars; and after we got them off, the top of a sheer strake was bad in spots, so we made it double, put another plate right on top of it; made good connections and put a guard bar on.

Q. Was that side plating that was covered with new plating,—was that removed at all?

A. The old plating was not removed.

Q. Was the bulkhead between the engineroom and the tank compartment, removed?

A. No.

Q. Were the engines taken out of the—main engines taken out of the engineroom?

A. No.

Q. Was any work done on the fuel piping in the engine-room?

A. Not that I recall, that there was anything done with that piping.

The Court:

Was she a coal or gasoline boat at that time? Was she a coal burner at that time?

Mr. Matteson:

Gasoline.

Mr. Thompson:

1922, your Honor, it is in evidence she was changed.

Mr. Matteson:

This is 1927 we are talking about.

Q. Was any electrical work done in the ship?

A. We might have done a little, but I don't remember what it was. I don't think any great amount.

The Court:

The witness spoke just now about water tanks. Are you referring now,—did you mean the gasoline tanks, when you said just now, water tanks?

A. No, sir, I meant water tanks.

The Court:

Where were those tanks?

A. In the forward part of the boat.

(By Mr. Matteson):

Q. What was done in respect to the water tanks?

A. Why after we got the plate off the bottom we found there was stops of the frame that was bad; and to get

in there to do the renewing, to renew the plate, we had to juggle the tanks around in there, move them from place to place so we could work.

Q. You say some repairing was done on the frames there?

A. Some slight, on a few frames; put in a few patches.

Q. The space where these water tanks were, was that forward of the space where the gasoline tanks were?

A. Yes, it was forward.

Q. Were the big cylindrical gasoline tanks of the Seminole taken out of the boat at that time?

A. No, they weren't taken out.

Q. Were the water tanks taken out?

A. No.

Q. Just moved around?

A. Just juggled them around so we could work around them, underneath.

Q. There has been a suggestion, Mr. Thibault, that the gasoline tanks were taken out and laid on the ways beside the ship, and that the bottoms of at least two of them were taken out and replaced. Will you tell us the fact with respect to that?

A. No, we didn't take them out or do any work on them.

Mr. Botts:

Will you read the answer?

(The answer was read by the reporter.)

(By Mr. Matteson):

Q. Was there any work done in the way of raising the level at which the gasoline tanks of the Seminole stood at that time?

A. No.

Q. Now Mr. Thibault it has been suggested that Merrill-Stevens did not keep any proper or accurate record

of the time of the men employed on that job, or what they did. Will you tell us what records were kept at that time?

Mr. Underwood:

We object to that on the ground that the records are the best evidence.

Mr. Botts:

We are not asking the contents of the records.

The Court:

Overrule the objection.

A. Go ahead?

Q. Yes, go ahead and tell us what the records were.

A. We had a system there of daily time slips for each man.

Mr. Underwood:

I object to the system; the question goes to the records kept on this particular job.

Mr. Matteson:

I think we are entitled to describe the system.

Mr. Underwood:

I don't think so.

The Court:

You would have to tie it up.

Mr. Matteson:

Yes, we are going to tie everything up as far as it can be.

Q. Well let's confine it to this particular job, Captain. Will you tell us what system you had with respect to keeping time and records of the work done on that job?

A. Each man made out a daily time slip, with the description of the job that he was doing, and the time that he spent on that job. His foreman that was directly over him took the time slips each night, went over them; if he found any discrepancies he would straighten it up with the man; and they were turned into my office and I went over them. If there was any notations on any of them slips, there was any question about it, it was straightened up before it went into the Accounting Department; and by ten o'clock the inspector on the job got a copy of the previous day's work,—time and materials, storeroom slips and so on; so if there was any question about these things, they was there to catch it. And if they were all right, there was no question about them, he okayed the slips, and he kept one copy, the other copy went into the office. And as I understand it, the bills was made up from them daily time slips.

Mr. Underwood:

I object to what he understands as to how the bills were made up, and move to strike it out.

The Court:

You mean to say Mr. Thibault that that was actually done, or what you understood was done?

A. It was done; there is no question about that. It was done.

The Court:

You are not just describing the system, but what was done on the Seminole job?

A. The bill was made up from them daily reports.

The Court:

Overrule the objection.

(By Mr. Matteson):

Q. Now to whom did you refer when you said, inspector?

A. Captain Nelson, the owner's representative on the job.

The Court:

Wait a minute, read that answer.

(The answer was read by the reporter.)

(By Mr. Matteson):

Q. You said something about at ten o'clock, the records was ready for the owner's representative; what did you mean by that?

Mr. Botts:

He said by ten o'clock.

A. We tried to have them,—the office tried to have them out by ten o'clock, so that they would know what time to go into the office to get them; and if they didn't get in there shortly, they were hunted up and handed a copy of it.

Q. Ten o'clock, what day?

A. Every day, of the previous day's work.

Q. I show you these documents, comprising Exhibit

4-L. I think you have seen those before?

A. Well I don't know whether I have seen them before or not. If there wasn't any question, these bills would never come to me. These originals was made up—

Q. I am not referring to the system at the time. Have you seen these before, these particular papers, before this minute, do you recall?

A. No, I don't.

Mr. Underwood:

Referring to Exhibit 4-L.

Q. Well then, will you look at them and tell us what they are?

A. These are copies of our daily time slips; the hours, daily time of each man, independent. When they make up these bills, they take it, if it is carpenters, two carpenters or four carpenters or five carpenters, they would take the total time and put it on the bill; otherwise it would be too long, to bill each individual man on the bill.

Q. Now Mr. Thibault, are those the bills representing the work that was done on the Seminole in the latter part of 1927, beginning June 20th?

A. Well we hauled that boat out first for a survey, originally, in the spring some time; I don't know whether it was April or May, somewhere along there; and we made a survey and ordered materials. Then the boat didn't come until the latter part of the summer; August I guess—or September. It says here, August 25th hauled out.

Q. Mr. Thibault I call your attention to the fact that as you go through these bills, under the labor charges, where you have, classification of labor, such as carpenters, helpers, electricians, boilermakers, or what not, in practically every case there is after the labor charge, a statement evidently—for instance the word, staging, after carpenters; what does that indicate?

A. Well that is building staging; that there would be staging, building staging to do the work on.

Q. Did these designations indicate the kind of work on which the men were engaged during the time for which the charge is made?

A. For that day, yes.

Q. Well taking these bills as a whole, do the designations placed on the labor charges in the bill, correctly show the work that was done by the men?

A. Absolutely.

Q. Now it has been suggested Mr. Thibault on this particular job, Merrill-Stevens had no supervision of the men, but simply assigned a certain number of men to Captain Nelson, and that the work of the men was done under the direction of Captain Nelson. Will you tell us what the fact is with respect to that?

A. The work was done under my supervision. I didn't see every rivet that was driven or every hole that was drilled or every nail that was driven. We had foremen on the job, and while Captain Nelson was the owner's representative, and inspector on the job, we done the work and put in the kind of plates that he designated. As far as having direct charge of the men, Captain Nelson didn't have any direct charge of the men.

Q. And who kept the records of what the men were doing?

A. Why as I say, we kept them ourselves, made up these daily time slips, and gave Captain Nelson a copy of them every morning.

Q. Are you still connected with Merrill-Stevens?

A. No.

Q. When did you sever your connection with them?

A. The spring of '34.

Q. Do you know where the original records from which these bills were made up, are now? Do you know?

A. No, I do not.

Q. Mr. Thibault, if the Seminole tanks,—if the gasoline tanks of the Seminole had been removed from the vessel and deposited on the slipway, and was later restored to the vessel, would there have been any charges that Merrill-Stevens would have made for that work, that would have appeared on the bill?

A. Absolutely.

Q. What sort of charges?

A. Well, charges the same as on this other one. Charges for hoisting, if we had had to remove plates or frames to get them in, it would have been mentioned. If we did move them out, there would have been charges for steaming,—freeing from gas, which we had no facilities for doing; we would have had to send them out. We didn't have steam enough to do it.

Q. You would have had to send the tanks somewhere else?

A. Somewhere where they had a steam plant, to steam them.

Q. Would there be any charges for transportation of the tanks?

A. Absolutely.

Q. Would there be any charges for steaming the tanks?

A. Absolutely, there would.

Q. About steaming the tanks, what does that amount to?

A. Well they say that clears them.

Q. I mean, how long do they have to be steamed?

A. Well, that is problematical, I guess.

Q. What was the usual practice?

A. I have never seen any that were steamed out that I thought was absolutely safe to put fire around them.

Q. Well is that the usual method of freeing them for work?

A. I think so, yes.

Q. Do you know how long it takes to steam them?

A. No, I couldn't say.

Q. Do you remember Mr. Simmon?

A. I believe I have seen him, I don't know that I ever spoke to the man in my life. I have heard of him.

Q. Could the gasoline tanks have been removed from the Seminole, through the side or bottom of the vessel, while on the ways, without the side plating or the floor frames or plates being removed?

A. No, sir, they could not.

Q. Would it have been practical to have removed them through the bottom of the vessel?

A. No.

Q. On the ways?

A. No.

Q. Why not?

A. After you got them down you had no place to get them out.

Q. You mean the vessel—

A. The keel of the vessel was not over $4\frac{1}{2}$ —between $4\frac{1}{2}$ and 5 feet off the ground, in the first place.

Q. And there wasn't room?

A. The railway was there in the road.

Q. Were any trays made to be placed under the tanks of the Seminole?

A. No, sir.

Q. Were there any trays placed under the tanks of the Seminole?

A. No, not at Merrill-Stevens at that time.

Q. Would it have been possible to place trays under the tanks of the Seminole without first removing the tanks?

A. I don't think so.

Q. Can you give us any idea with respect to the relative cost of removing bottoms of the tanks of the Seminole and testing—examining the tanks and placing them back and re-riveting them—the necessary incidental expenses that would be involved, as compared with the cost of new tanks?

A. Well, even if you placed new tanks, you would have to go through the same procedure to take the old ones out.

Q. Without the procedure for taking them in or out, of course you would have that; but including the expense of steaming, and taking rivets out, re-riveting them, whatever was needed in them, could you give us any idea of the relative cost of that operation as against the cost of new tanks?

A. No, I don't know that I can.

Q. Do you remember whether there were any zinc plates placed on the Seminole at that time?

A. Yes, sir.

Q. Can you give us any idea of the number of them?

A. No, I don't know as I know the number of them. There was plenty of them placed around the struts and the shaft logs and over the shafting between the shaft log and the struts; and over the wheel.

Mr. Underwood:

I am sorry, I can't hear you Mr. Thibault.

A. I say, there was plenty of them placed over the wheels and on the struts and on the shaft log, that project from the hull that the shaft came through, both sides of the boat, you know; it was a twin-screw.

Q. Were they placed at any other parts of the ship that you recall?

A. No, I don't.

Q. If the rivets were taken out of the bottom of the tank, and then the bottom of the tank were replaced and re-riveted, can you tell us whether or not the same sized rivets would be used?

A. No, sir, they would have to be larger rivets.

Q. Have to be a larger rivet?

A. Reamed for larger rivets.

Q. Why would that be?

A. Well most of the holes, when you drive a rivet, a hot rivet into a hole, you swell your material enough that when you drive that cold rivet out of there you de-

face that hole more or less; so you would have to ream them and use a larger size rivet.

Q. Were you at one time employed by the Gibbs Gas Engine & Power Company?

A. Yes.

Q. Did you have something to do with the construction of the Fortuna?

A. Yes.

Q. What did you have to do with that?

A. Well I was superintendent of construction at that time.—Gibbs Gas Engine Company.

Q. Do you remember the type of gasoline tanks that were placed in her?

A. They were brazed steel tanks, called the Jennie Steinway.

Q. Were they cylindrical tanks?

A. Yes.

Q. And they were galvanized, do you remember?

A. I don't remember.

Q. Did you afterward have something to do with the building of the Fortuna?

A. Yes, I lengthened her out, here in Miami; about seven feet on the after end.

Q. When was that?

A. '25 I think; fall of '25.

Q. Was any change made in her gasoline tanks at that time?

A. No, sir.

Mr. Underwood:

I didn't hear an answer to that last question.

(The last question and answer were read by the reporter.)

Q. Did the alterations affect the part of the boat where the gasoline tanks were?

A. No.

Q. Gasoline tanks were not disturbed?

A. Not disturbed.

Mr. Matteson:

That's all.

Cross Examination.

By Mr. Botts:

Q. Mr. Thibault, will you tell us what is the nature and extent of your experience as a shipbuilder?

A. Well I have been at it over 50 years.

Q. And where did you get your early experience?

A. I learned my trade as a ship carpenter in Marine City, Michigan, in the Wm. B. Marley plant.

Q. And have you ever worked for any of the larger ship-building companies?

A. Oh, yes; I worked for several of the Lake companies; worked for Wm. Kraft & Sons.

Q. Philadelphia?

A. Yes.

Q. How long did you work for them?

A. Oh, about three years, during the Spanish-American War, and after.

Q. What kind of work did you do?

A. At that time I had charge of the lining; that is what they call the lining; that is laying out shell plating; lining out plates for the shell plating.

Q. You were in capacity as a foreman or superintendent of that work?

A. Not superintendent; they used to call us "five-eighters" in those days.

Q. Did you do any loft work?

A. Oh, yes.

Q. What do you mean by that?

A. Well that is taking the architects' drawings and offset of of the vessel to be constructed, and reproduc-

ing them full size for getting out the shapes, forms and so on.

Q. Now then you stated that you worked for the Gibbs Gas Engine Company and for Merrill-Stevens in Miami. Did you ever work for any of the other boat building or drydock companies in Florida?

A. In Florida?

Q. Yes.

A. No.

Q. Didn't you work for Merrill-Stevens in Jacksonville at one time?

A. I worked at Jacksonville, but that is all the same company.

Q. But I distinguish between Miami and Jacksonville. How long did you work for Merrill-Stevens in Jacksonville?

A. I came down to Jacksonville in the fall of 1906, and finished up their drydock, and I stayed with them,—I was to stay with them two years, but I stayed nearly three; then I went into a little boat building place of my own.

Q. Operated your own establishment over in South Jacksonville?

A. Yes, I operated that until the war came on, then the Shipping Board came in there and took everything I had,—my machinery and my lumber and my men. I was doing all the essential work,—yacht work; and then that is what I hooked up with the Gibbs Gas Engine Company.

Q. Well you have been in the ship building and boat building and repair, for over 50 years you say?

A. Over 50 years.

Mr. Botts:

That is all.

By Mr. Matteson:

Q. Are you employed by anyone now?

A. I am working on my own hook now.

Q. Doing ship building?

A. Boat work.

By Mr. Botts:

Q. Trying to get back to where you were before the Government caught you?

A. Yes.

Mr. Anderson:

That is a long way off.

By Mr. Matteson:

Q. Just one more question, Mr. Thibault. Would it have been possible to have done work on these tanks on the ways alongside of the Seminole?

A. No, sir.

Q. Why not?

A. Wasn't any room on the ways. Another thing, we wouldn't monkey around with gas tanks close to where men was working.

Mr. Matteson:

That is all.

(Thereupon the hearing was recessed until 1:45 o'clock P. M. of the same day.)

Friday, November 17, 1939, 1:50 o'clock P. M.

Hearing was reconvened pursuant to the noon recess, and the witness THIBAULT resumed the stand and further testified as follows:

Thereupon:

Cross Examination.

By Mr. Underwood:

Q. Mr. Thibault, how do you happen to be here to-day?

A. Why, Mr. Matteson over there asked me to come.

Q. When did you make his acquaintance?

A. Oh, some time about a month ago.

Q. Who introduced you to him?

A. Captain Patton.

Q. When did you meet Captain Patton?

A. Oh, I have known Captain Patton for several years, I don't know just how long.

Q. When did you first talk to Captain Patton about this case?

A. About a month ago, when he asked me.

Q. Have you seen any of the records of the Merrill-Stevens Company with reference to the work that was done?

A. When?

Q. Since 1927.

A. No, only I have seen them here this morning.

The Court:

Talk a little louder.

A. Only that I seen here this morning.

Q. Referring to this batch of bills?

A. Yes.

Q. Exhibit 4-L and perhaps this little batch of bills?

A. Yes, I imagine.

Q. Exhibit 4-M. Now you looked at these for about five minutes this morning, didn't you?

A. That is all.

Q. And that is the first time you have seen those bills since 1927, is it?

A. I don't even know whether I have seen them in 1927.

Q. At any rate, if you did see them in 1927, you didn't see them until this morning?

A. Not until this morning.

Q. It was in August of 1927 the Seminole was hauled out on the marine railway, was it?

A. It was the latter part of the summer, some time.

Q. And it was on the marine railway, and not a drydock; is that right?

A. Railway drydock.

Q. But she wasn't in a proper drydock, was she?

A. It is a railway drydock; that is a proper drydock, a railway drydock.

Q. You mean, it is a combination?

A. There is three kinds of drydocks; a graving dock, floating drydock, and a railway drydock.

Q. Suppose you tell us what this was?

A. This is a carriage that works on rollers, that rolls down in the water and floats the boat on it; then pull her up out of the water.

Q. You mean that she is placed on the carriage of the railway while afloat in the water?

A. Yes.

Q. And then she is hauled out?

A. She is hauled out, cradle and all.

Q. There isn't any structure out of which the water is pumped?

A. No.

Q. Such as in a, strictly speaking, drydock?

A. No.

Q. How many such marine railways were there at that time?

A. Two.

Q. Were they side by side?

A. No.

Q. How far apart were they?

A. Oh, I imagine the number one railway at that time was four or five hundred feet from number two; but at the same time they were digging a slip for number three railway next to this number two.

Q. Which marine railway was the Seminole on?

A. Number two.

Q. Do you remember how long she was on the marine railway, out of the water?

A. Oh, I imagine she was out there eight or nine weeks.

Q. You did quite a lot of steel work on her, didn't you?

A. Yes, sir, we did.

Q. I think you said that included the bottom and side shell plating, is that right?

A. Bottom and sheer strake shell plating, yes, sir.

Q. Suppose you tell us just how far up,—start at the keel and go up; how far up did you work?

A. Came up from the bottom to the turn of the bilge where places were bad; and then the sheer strake, which is the top strake on the boat; the top strake and the main hull structure.

Q. Is it your recollection that you took off any plates below the sheer strake and above the bilge?

A. No, took none,—removed none of them.

Q. You mean your recollection is that you didn't remove any of those?

A. Absolutely.

Q. Quite clear about that?

A. Quite clear.

Q. Have you refreshed your recollection from looking at any other papers of any kind?

A. No.

Q. And you are not at all clear that you ever saw these bills before, is that right?

A. No, sir.

Q. You now have no recollection of ever seeing them?

A. No, I can't say that I have.

Q. How many men were employed in Merrill-Stevens plant, approximately, during the late summer and fall of 1927?

A. Oh, we probably had between 50 and 60.

Q. And how many jobs besides the Seminole were done between August and through the balance of that year?

A. I don't remember that.

Q. That was the busy season for your business out there then, wasn't it?

A. At that same time we were building them steel sheds, and also building number three railway.

Q. Have you any idea now what other jobs were in the yard at that time?

A. No, I couldn't remember.

Q. Can you remember the name of any other vessel that you worked on at that time, during that interval?

A. Not unless someone called my attention to it.

Q. What was the shape of these tanks that you worked on in the Seminole?

A. Cylinder tanks, water tanks. We didn't work on any gasoline.

Q. You say they were cylindrical tanks?

A. Yes.

Q. Sure about that?

A. I am almost positive of it, yes.

Q. Have you any recollection as to what their capacity was?

A. No.

Q. What did you do to them?

A. I didn't do anything to them but take the piping away so we could work around them, to get at the rivets and the shell plating.

Q. Where were they?

A. Under the cabin floor and the forward end of the boat.

Q. Did you do any work on the top side at all?

A. Yes, we put a double strake and new guard irons, new guard bars.

Q. Apart from the steel work now on the passenger's or crew's quarters, or on the deckhouse?

A. Yes, I believe we did do some general work all over, around in different parts of the boat.

Q. Do you remember what that was?

A. No, I can't remember the details of it.

Q. Did you do any work on the anchor or the anchor chain?

A. Possibly, I don't know.

Q. Do you remember that?

A. I don't remember that, no; I wouldn't remember that little item.

Q. Draw the tail-shafts?

A. I wouldn't swear to that.

Q. Don't remember that. What was the deckhead of the engineroom constructed of?

A. The what?

Q. The deckhead of the engineroom. The deckhead; do you know what that means?

A. I don't know what you mean.

Q. Well what was the roof of the engineroom constructed of?

A. I guess that was a wooden deck, I believe.

Q. Is that your recollection?

A. Yes; may have been steel beams.

Q. Were you in the tank compartment where the gasoline tanks were?

A. No.

Q. Do you know what the roof of that compartment was constructed of?

A. No.

Q. Do you know what was situated above the engineroom?

A. Nothing I believe except there had been a skylight sometime or other, over the engineroom; just an open deck.

Q. You mean there had once been a skylight there but there was no skylight at that time?

A. I believe when she was steam, there was a skylight there.

Q. But at the time you were in her, there wasn't any skylight?

A. Not that I remember.

Q. What was above the tank compartment?

A. The Captain's stateroom.

Q. You remember that?

A. Yes.

Q. Did Nelson live on the boat while you were working on her?

A. Several men on the boat; whether they stayed there night and day, or not, I don't know. They were on the boat in the day.

Q. What other steel work did you do besides steel plating?

A. Why we patched up some frames, renewed some bad frames in the forward end of the boat; put new guard bars around her on the top strake. That is all the steel work we done. I think we done a little rail stanchion work; maybe a little general repairs, and something like that. I wouldn't remember them little items.

Q. You say you patched up some frames?

A. Yes, forward.

Q. Do you remember which frames those were?

A. I don't remember which ones, but they were in the forward part of the boat, under the water tanks.

Q. Under the water tanks?

A. Under the water.

Q. Do you remember whether you patched up any frames any place else?

A. No, I don't.

Q. Sure about that?

A. Absolutely.

Q. How long since you have been employed by Merrill-Stevens?

A. I left the spring of '34.

Q. What was the occasion of that?

A. Well I just left, I just wanted to change.

Q. What have you been doing since that time, Mr. Thibault?

A. Well part of the time I wasn't doing anything particular; part of the time working on my own hook.

Q. What are you doing now?

A. Rebuilding a boat.

Q. Whose boat?

A. Belongs to Peters; 60-foot sight-seeing boat.

Q. Do you have a plant of your own now?

A. No, I rent space in Nuta's yacht basin.

Q. Where?

A. Nuta's yacht basin.

Q. How old are you Mr. Thibault?

A. Seventy,—past.

Q. I would like to have it a little clearer, just what your job was at Merrill-Stevens in 1927:

A. Well I was General Superintendent in charge of all operations in the yard.

Q. Were you in charge of the construction work that was going on for Merrill-Stevens as well as the repair of vessels?

A. You mean, construction work in the yard?

Q. Yes:

A. No, not in charge of it so much, except seeing that they were doing it according to contract, that's all.

Q. Was that your job?

A. Absolutely.

Q. Was your job to see that number three marine railway which was being constructed then—

A. Absolutely.

Q. —was constructed according to the plans?

A. According to my plans that I made myself.

Q. What was this other job that was going on?

A. Building them steel sheds.

Q. Was it your job at that time to see that they were properly constructed?

A. Absolutely.

Q. How many sheds were there?

A. Well there was about 56,000 square feet under cover down there. They are practically all connected; they run different sheds, but they are all under one roof.

Q. All steel framework?

A. All steel.

Q. You inspected those things every day, did you?

A. Absolutely. Put in our own foundations, contracted for, the erection of the building.

Q. Now did you have occasion during that summer and fall to do work on other boats besides the Seminole?

A. Oh, I believe we did. We always was doing work on other boats.

Q. Some of them would be afloat I suppose?

A. Some afloat, some in dry storage, some in wet storage.

Q. You did work on vessels that were afloat, as well as vessels that were dry?

A. Oh, yes.

Q. Were you personally in charge of all the work that was done on all those vessels, too?

A. I was the General Superintendent. I didn't see every nail that was driven or every hole that was bored or every rivet that was put in; that was an impossibility.

Q. Were the gasoline tanks taken out of any other boat between the first of August and the end of December, 1927?

A. No; no gasoline tanks were taken out of any boat, no.

Q. Did you ever take a gasoline tank out of a boat?

A. Yes.

Q. Quite sure you didn't do it that year?

A. No; I took a gasoline tank out of a boat this year.

Q. Well I am thinking about 1927 Mr. Thibault. Quite sure you didn't take a gasoline tank out of any boat at all in that year?

A. Not that I can remember. There might have been some little boat there that had a five or ten or a fifteen gallon tank that came out; I wouldn't pay much attention to that.

Q. Then you might have taken a gasoline tank out of some boat?

A. We might have.

Q. You don't remember whether you did or not, is that right?

A. I don't know.

Q. I suppose you were around the yard every day?

A. Every day.

Q. All day, every day?

A. No, I can't say that I was right in the yard all day every day, but I was in the yard most of the time every day.

Q. Did you inspect every job every day?

A. Absolutely.

Q. No question about that?

A. No question about that.

Q. Who was the foreman that you spoke of this morning?

A. Well we had a gang of the iron workers from Jacksonville; a man by the name of Reinahan was fore-

man of that crowd. Then we had A. R. Saruis that was foreman of the carpenter gang,—laborers.

Q. Do you have only one gang of iron workers?

A. Well, what do you call a gang?

Q. Well, whatever the terms are.

A. A gang can consist of two men or it can consist of fifty men.

Q. Well you had one foreman for the steel work, did you?

A. One foreman for the steel worker's, yes.

Q. And you might have had several gangs working under him?

A. We had two or three gangs of riveters, and we had lay-out platers, that lay out the plates, and fellows to punch the holes, and so on.

Q. Then if steel work was going on elsewhere than on the Seminole, one foreman would have charge of the Seminole and the other work too?

A. No.

Q. That is not right. Well what is right? You tell me.

A. Well if we had other jobs of steel work going on, there would be another foreman on the job.

Q. Did you have more than one foreman there that fall?

A. That is all the steel work we done.

Q. From the first of August until the end of December, is that right?

A. Yes.

Q. What was his name?

A. Callahan, or Reinahan; he come out of the Jacksonville yards; they sent the steel working crowd down here from Jacksonville.

Q. Where is he now, do you know?

A. I suppose, in Jacksonville, I imagine.

Q. Now you say these men kept their own time?

A. No, sir, I didn't say they kept their own time. They made out their own time slip, submitted it to their foreman.

Q. That would be Callahan, or whatever his name was?

A. Whoever he was; and they checked them over, and they were returned to me.

Q. Every day?

A. Every day.

Q. Now is that the ordinary routine you are talking about?

A. Absolutely that is the ordinary routine, every day.

Q. What was the routine on the Seminole, do you remember that?

A. The same as that, exactly, every day.

Q. Sure about that?

A. Absolutely.

Q. And do you mean that you would look them over every day?

A. Absolutely.

Q. Every time slip in the yard?

A. Every time slip in the yard went through my hands before it went into the office.

Q. What were the working hours there at that time?

A. Eight hours a day.

Q. What time did that start and stop?

A. From eight to twelve, twelve-thirty to four-thirty.

Q. Four-thirty you would get all these cards?

A. Yes; I would get them at four-thirty, no, it would be about five o'clock. Lots of times I wouldn't get through with them until eight o'clock the next morning, because I didn't have that kind of hours; I went to work at seven o'clock.

Q. You looked over every time card?

A. Every one.

Q. And what did you do with them?

A. After I satisfied myself they were all okay, they were turned into the office.

Q. Okay in what respect?

A. That the times were right, and the charge to the right job, that particular part of the job.

Q. What do these time cards look like?

A. They are printed slips, with the location for a man's time,—his straight time and overtime, and so on, on it; a place for a description of the work that he worked on, and a place for the number of hours.

Q. You indicate a slip about eight inches high?

A. No, I imagine they were about $4\frac{1}{2}$ x 7.

Q. Four and a half by seven?

A. Something like that.

Q. A man had his name on there?

A. Absolutely, it had a name, a job that he worked on.

Q. The name of the boat or boats that he might work on that day?

A. Name of the boat.

Q. The number of hours on each?

A. Yes.

Q. What else?

A. Wasn't anything else for him to put on.

Q. Now the foreman, what did he put on? Anything at all besides his okay?

A. Foreman looked over them and okayed them, and if there was anything they couldn't agree, he made a notation on that time slip.

Q. In the ordinary course he wouldn't put on anything but his okay, unless there was some discrepancy?

A. If he was satisfied they were all right, he okayed them; if not, there was a notation made on that particular slip; and I took it and the next morning we cleared it up.

Q. The ones there was a dispute about, you looked at?

A. I looked at them all and had to okay them.

Q. You had to put your okay on every one?

A. Every one.

Q. How many would there be in the course of a day?

A. According to the number of men.

Q. Well how many?

A. Well we would have anywhere—

Mr. Botts:

At what day are you talking about? Fix a day.

(By Mr. Underwood):

Q. Can you fix a day?

A. Certain date? No.

Q. Well what would an average day be? How many time slips?

A. How many time slips? Probably about fifty.

Q. The Superintendent of the yard looked at every one?

A. Absolutely every one of them.

Q. What did you do with them?

A. I turned them into the office; that is what they made the bills out by.

Q. Did you ever see them again?

A. Not necessarily.

Q. Did you have anything to do with the making up of the bills?

A. No, nothing in the world.

Q. You never have been in the Accounting Department, have you?

A. What?

Q. You have never been a part of the Accounting Department, have you?

A. No.

Q. I still don't quite understand the purpose of your putting your okay on these daily time slips. Were you in a position to check each slip as to the number of hours each man put on each job? Were you?

A. Absolutely.

Q. That is to say, if John Jones, carpenter, put down eight hours on the Susie Bell, and his time slip came to you for your okay, you would know whether he had put eight hours on the Susie Bell?

A. I would absolutely know if that carpenter had eight hours on the Susie Bell; I would absolutely know it.

Q. And you would know it from what?

A. From my own experience, and knowing how to take care of the men.

Q. If you had fifty men in the yard working on a particular day, whose time slips you looked over, you would know of your own knowledge when you came to check over those time slips, how many hours each man had put on each job?

A. If I wasn't satisfied—

Q. Is that right?

A. Just wait a minute.

Q. Well I am not asking you about, if you are satisfied. Will you read him the question, please?

Mr. Matteson:

If your Honor please, I think the witness is entitled to answer it and make his explanation.

Mr. Underwood:

Well, to answer it, certainly; but he hasn't answered it.

Mr. Botts:

➤ You didn't give him a chance to answer it.

Mr. Underwood:

He wasn't answering.

The Court:

Will you read the question?

(The last question was read by the reporter.)

A. Can I answer that in my own way?

The Court:

Yes, sir.

A. If I had any doubt, in running over them time slips, if there was any doubt in my mind, then I took that time slip, went to that man's foreman and that man, and we got it straightened out right then before it was okayed.

(By Mr. Underwood):

Q. Well I am afraid you haven't quite understood my question, Mr. Thibault. Suppose you had fifty men working in the yard on a particular day, one of them was John Jones, a carpenter, and he was working on the Susie Bell. At the close of that day would you get a time slip from him which says, "John Jones, Carpenter, Susie Bell, eight hours"? Would you know of your own knowledge that he had spent eight hours on the Susie Bell?

A. Sure.

Q. Would you remember, at the close of each day, what time he checked in the morning and what time he checked out at night?

A. Just a certain time he had to check in; he couldn't check in any other time.

Q. Suppose he put six hours on the Susie Bell and two hours on some other boat, on his time slip, would you know of your own knowledge what time he left the one and went to the other?

A. I expect I would, because I would be the fellow that would assign him to the job.

Q. It wouldn't be the foreman?

A. Not on jobs like that; I did that myself.

Q. So you want us to understand, do you, that at the close of each day, you would know how many hours each man in the yard had spent on each job?

A. After checking up his time slips, yes.

Q. Well, only after checking up his time slips?

A. Sure.

Q. Do you remember how much of the bottom plating you renewed?

A. No, I don't remember. I know the total number of plates was somewhere around seventy, on the job.

Q. Were they scattered all over the boat, or all concentrated in one section?

A. On the sheer strake, they went all the way around the boat; and under the bottom, on the end, I think on the ends of the boat, there was some left,—some of the old plating left.

Q. Well you said something about renewing plating under the bottom, forward. Do you remember how much plating you renewed up there?

A. I don't remember the exact number of plates, no.

Q. Did you renew the bottom generally, forward?

A. Yes, generally. We opened up quite a big body of it, I know.

Q. How much amidships?

A. Some of it run back amidships, and ran all along on the bottom.

Q. And how about aft?

A. Same way.

Q. Well let's see; how about the strake next to the keel; did you take all the plates out on either side?

A. I don't remember whether we took them all out or not.

Q. Well did you take out any under the gasoline tanks?

A. I don't even remember that, but I imagine we did.

Q. Take out any under the engineroom?

A. Oh, yes.

Q. Are you sure about that?

A. Yes.

Q. Do you remember how general that was?

A. Pretty general under the engineroom, I believe.

Q. You wouldn't go so far as to say you took them all out under the engineroom, would you?

A. No.

Q. Do you remember whether she had a generator in the engineroom?

A. I don't know whether she did or not; I had nothing to do with that.

Q. Take out any plates under the generator?

A. I don't know. That is in the engineroom I suppose, and I expect we did.

Q. Took out any plates under the engines themselves?

A. I think so.

Q. But you didn't take up the engines?

A. No, we didn't take the engines out.

Q. Do you remember how the engines were bedded?

A. That has got nothing to do with the plating, how the engines are bedded. They don't touch the plating.

Q. Do you remember how they were?

A. No, I can't say that I do.

Q. Well how did you get to the plates, under the engines, to rivet the plates back on?

A. There is plenty of room under there; them engines are probably that high.

Q. Lots of room under the engines, were there?

A. Yes.

Q. Practically about a foot?

A. Yes.

Q. A man could work under there without any trouble?

A. Yes.

Q. Since we have been discussing this, Mr. Thibault, have you thought of the names of any of the other boats that were there from the first of August to the end of December, 1927?

A. We had at that time approximately a hundred boats in the yard; I don't know that I could. I might offhand

name a few of them. We probably had a hundred boats; the yard was full of storage, at the time.

Q. Have any of the photographs of the Seminole been shown to you recently Mr. Thibault?

A. I think I have seen a couple, some time ago, down there around Nuta's yard; they was showing some of them pictures. Whether it was Pilkington's yard, I don't know; I have seen some of them from somebody, but I don't remember who.

Q. Then as I understand it Mr. Thibault you haven't seen the Seminole since this job was done in 1927—early 1928?

A. Oh, yes, I have seen her lots of time.

Q. I mean, to work on her?

A. No; I don't know that we ever hauled her out after that, or not. She was hauled out a couple of times a year; I don't remember when the last time was.

Q. You say she had been surveyed in the spring of 1927?

A. Yes, if I remember rightly they went over it and we made them up a—

Q. I am sorry, but I am afraid the reporter is having difficulty in hearing you.

A. She come in there for a survey and we ordered plating and angle bars and so on, like that, which we expected, and after we hauled out they found out they had to remove extra plates and had to put double that, if I remember rightly.

Q. Do you remember who made that survey?

A. That was made directly under Captain Nelson's supervision.

Q. Anybody else participate in it, as far as you know?

A. He was the man that said what was to come out. We gave him the men to help him.

Q. Did you go over the job with him at that time, to decide how much plate to get, and that sort of thing?

A. Yes; I think, if I remember rightly, we made him up a plan showing the number of plates, so he could submit to his owner, the number of plates that had to be removed.

Q. Was there a survey written up?

A. I don't remember.

Q. Were the plates marked and numbered?

A. They were on this plan, yes.

Q. How long since you have seen that plan?

A. I have never seen it since.

Q. Then you don't remember doing any work on the Seminole from the time you finished this job in 1927 or early 1928, is that right?

A. No, I don't remember whether we ever hauled her out after that or not.

Q. Well when did she next come to your attention in any particular way?

A. Why I don't know, unless when she burned up up there at Lauderdale.

Q. You remember reading about that in the newspapers I suppose?

A. Yes.

Q. Then the Seminole was next brought to your attention when Captain Patton called on you about a month ago?

A. No, I had seen her every day for the last couple of years.

Q. I mean, the next time you had any conversation about her?

A. Oh, I guess I have had conversations about her with different people, in an offhand way I guess; I don't know.

Q. About the work that was done in 1927?

A. No.

Q. You hadn't considered this 1927 work since the time the job was finished, until Patton called on you?

A. No; not in any particular way, I don't suppose I have.

Q. Hadn't discussed it particularly with anybody?

A. No.

Q. Well what you have given us here today is your recollection after twelve years, approximately?

A. Well it is very easy to recollect.

Q. Is that right?

A. Yes.

Q. Unrefreshed by any written documents; and you began thinking about that work for the first time when Captain Patton called on you about a month ago; is that right?

A. Yes.

Mr. Underwood:

That is all.

Re-Direct Examination.

By Mr. Matteson:

Q. Mr. Thibault you said something about it was easy to recollect; what did you mean by that?

A. Why because it was a job out of the ordinary for that yard. We had no facilities ourselves for doing steel work, and it was the only real job of steel work that the yard ever done. That's why it is easy to recollect it.

Q. You spoke of several men being on board the yacht at the time the work was done. Do you refer to members of the crew?

A. If I remember rightly, there was an engineer aboard, and some of the crew aboard.

Q. Do you remember who the engineer was at that time?

A. I think it was a man by the name of Brown.

Q. Do you remember any of the others?

A. No, I don't remember any of the crew's name.

Q. These plates that were renewed, of course it is abc to you, but are these on the outside of the ship?

A. Outside, absolutely.

Q. On the outside of the frames?

A. Yes, absolutely.

Mr. Matteson:

That is all.

Mr. Underwood:

In order to rivet the plates on the outside, you have to have a man both outside and inside, didn't you?

A. Yes.

Mr. Underwood:

That is all.

By Mr. Matteson:

Q. Of course, whenever you do any riveting, you have to have a man on each side?

A. If you rivet, yes.

Q. And the man on one side operates the hammer, the man on the other side holds—

A. The "holder-on".

Q. So the "holder-on" holds the tool against the rivet, to hold it in place?

A. The head of the rivet.

Mr. Matteson:

That is all.

(Witness excused.)

4026 Thereupon L. T. BROWN was recalled as a witness on behalf of Libelants, in rebuttal, and further testified as follows:

Direct Examination.

By Mr. Matteson:

Q. Mr. Brown, were you on the Seminole in 1927 when the Seminole was at the Merrill-Stevens yard for some work, in the latter part of that year?

A. Yes, sir.

Q. What was your position there?

A. Chief Engineer.

Q. Were you there during the whole period of the repairs, in the latter part of 1927?

A. Yes, sir.

Q. Did you receive pay, were you on the payroll I mean, of the Seminole, at the time?

A. Yes.

Q. Were there any other members of the crew on board?

A. Yes, there were several that I remember,—that I recall.

Q. Do you remember who they were?

A. The Captain and myself, and my oldest boy was on,—that I know definitely. I couldn't swear to the other names, but there was several of the deck crew retained.

Q. Was that during the whole period of repairs?

A. Yes.

Q. In the course of about what part of the year did that work begin, do you recall?

A. I don't recall exactly; along during the summer, it seems; the latter part of the summer.

Q. Now during that period of repairs there at the yard, were the gasoline tanks of the Seminole removed from the vessel at any time?

A. Gasoline tanks?

Q. Gasoline tanks.

A. No, sir.

Q. Was the position of the gasoline tanks changed?

A. No, sir.

Q. Were the tanks elevated,—that is, put in a higher position, two or three feet?

A. No, sir.

Q. Was the bulkhead separating the space where the tanks were, from the engineroom, removed?

A. No.

Q. Were there any trays installed under the tanks in the Seminole at that time?

A. None whatever; during that job?

Q. During that job.

A. No, sir.

Q. Were the engines removed,—the main engines of the Seminole?

A. The main engines were not moved; no, sir.

Q. Tell me what work was done in and about the engineroom during the period of the repairs that I speak of?

A. I pulled the generating set, which is a small Winton, from under the Engineer's room, and set it out just to the port side of the port main engine. Of course that necessitated making new timbers for her, and bolting it in; but that was just simply moved from one position to the other, to make it more accessible. Put in a new workbench; and a small auxiliary set was built,—I built it out of some pieces I had around there,—an old engine and an old motor that I used.

Q. Who did the work in moving the generator?

A. Well I did most of it myself, with the help of a man from the yard, for a while; possibly two men for a while; that is the yard,—the Merrill-Stevens furnished. I would say one or two men for one or two days, but for a short time, to help on the job.

Q. Any of the members of the crew assist you?

A. Well I worked that boy of mine wherever I could work him; he was possibly helping too while we were moving it.

Q. In connection with the moving of the generator, did that involve any alterations or changes, anything else in the engineroom?

A. No, I wouldn't say any changes that did not affect the generator itself.

Q. Was any electrical work done?

A. The generator wires were possibly lengthened out, a matter of seven or eight feet.

Q. Was that all?

A. That's all.

Q. Were any changes made in the gasoline piping from the tanks?

A. The only change in that generator of mine, taking out the old line and running a new line to the new position.

Q. Was the gasoline piping renewed at that time?

A. That part was; I put in copper tubing as I remember it.

Q. For the generator?

A. For the generator.

Q. Any of the rest of it changed?

A. No, sir.

Q. Prior to the time that you went to Merrill-Stevens for repairs, had you had any difficulty in the gravity feed of gasoline from the tank to the main engines?

A. No, sir.

Q. Was the side plating of the Seminole removed in the way of the engineroom and tank space at that time,—any of the side plating?

A. No, there was no side plating removed.

Q. Was there some bottom plating?

A. Yes, part of it.

Q. Were the floor frames or plates removed under the engineroom or tank compartment?

A. No, sir.

Q. With the side plating in place, and the floor frames and plates in place, it would have been possible to remove the gasoline tanks from the Seminole through the bottom or sides of the ship?

A. No, it wouldn't.

Q. Was any work done on the gasoline tanks at all at that time?

A. None whatever.

Q. What construction of the vessel was over the tank space or the space where the gasoline tanks were, can you tell me?

A. Amidships there was the after end of the forward deck house, which was used as a Captain's cabin.

Q. Can you point that out on this plan which we have here, Phipps Exhibit A?

A. There is your tanks, engineroom and the tanks; across here would be the Captain's room; it set directly above here. It seems to be a little bit long, but the Captain's room would come right about in there somewhere. That may be just right; I guess it is.

Q. And the Captain's room to which you refer is the room that is marked "Captain's Stateroom" on the plan, on the upper half of the sheet, is that right?

A. That is right. This is the forward deck house, or the music room as we called it.

Q. That is forward of the Captain's Stateroom?

A. Forward of the Captain's stateroom; and this Captain's room extended back to the smokestack, which we installed at Palm Beach; we installed a toilet and wash stand and shower bath and the smokestack; that extended out in here.

Mr. Underwood:

In the engineroom.

Q. Was there any opening through the tank space to the Captain's room or the deck over the tank space?

A. No, sir.

Q. Was any part of the deck or the Captain's cabin, over the tank space, removed at this time, during this period of repairs?

A. No, sir, there was none of this removed; no, none of it.

Q. Was there any means of access to the tops of the tanks through the Captain's room or through the deck, over that space?

A. No, sir.

Q. No way of getting at them at all?

A. No way of getting at them at all.

Q. Was there any way in which you could get at the air vent lines on the tops of the tanks to do any work on them or inspect them?

A. No, sir; they were forward of the engineroom bulkhead.

Q. And under the Captain's cabin, or the deck, as you described?

A. Yes.

Q. It has been suggested Mr. Brown that during this period, between midsummer and the end of the year, while these repairs were under way, that the gasoline tanks were removed from the vessel and that two of them were laid alongside of the vessel, on the ways, or on the dock, and that the bottoms of at least two of them were removed so that the interior of the tanks could be examined. Will you tell us what the fact is with respect to that?

A. The tanks were removed and placed?—I think it has been covered, hasn't it? They were not removed.

Q. They were not removed.

A. No, sir.

Q. Then the work that I described was not done?

A. No, sir.

Q. During that period did you ever see a pile of rock or residue or any other substance from those tanks that was piled outside the vessel in any place whatever?

A. From the tanks?

Q. Yes.

A. No, sir.

Q. Were the main engines removed—

A. Removed?

Q. Yes, were the main engines removed or disturbed in any way?

A. No, sir, they weren't moved even in the engineroom.

Q. If the bulkhead between the engineroom and the tank compartment had been removed, was there anything in the engineroom that would have to be moved out of the way for that to be done?

A. Move the bulkhead?

Q. Yes, if you were going to move that bulkhead out, was there anything in front of the bulkhead you would have to move out of the way?

A. There was a workbench, and bilge pump; one of the auxiliaries; log desk, which don't amount to much; and a set of batteries,—two sets of Edison batteries against the bulkhead.

Q. How were the batteries fixed with respect to the bulkhead?

A. They were in shelves that were fastened in some way to the bulkhead.

Q. Mr. Brown do you remember the passageway that ran along the starboard side of this ship beside the engineroom?

A. That is this one.

Q. Marked "passage" in the lower diagram on this plan, Exhibit A?

A. Yes, sir.

Q. Do you remember that passageway?

A. Yes, sir.

Q. I want to ask you with respect to the bulkhead that ran along that passageway, separating it from the—separating the passage from the engineroom and from the space where the tanks were: the side of this bulkhead, the passageway side,—can you tell me whether that was sealed, or whether there was some joiner work or paneling or woodwork on it?

A. That was a steel bulkhead, with the seams showing into the engineroom; that is the frames were on the engineroom side. It was perfectly plain in the passageway.

Q. A plain seal?

A. Yes; yes, sir.

Q. Painted I suppose?

A. Painted.

Q. Mr. Brown it has been suggested here that on the Seminole there were four two-inch pipes leading from the deck above the engineroom down through this passageway, in the points that are marked with white dots on this exhibit. Do you see the points?

A. Yes, sir.

Q. Were there any such pipes,—I might add that these pipes terminated on the deck above, with gooseneck fittings, so that they turned over and faced down to the deck, and that the pipes lead down through the passage, to the bilge of the engineroom. What is the fact with respect to that?

A. They were not on there when I knew the ship.

Q. Not up to the time you left her?

A. No, sir.

Q. Now it has also been suggested that there were in the engineroom of the Seminole, four similar pipes on the port side, leading from the deck above, and finished on the deck above in the way I have described, leading down into the engineroom on the port side, in approximately the locations indicated by those white dots that appear on that side of the diagram. Will you tell me what the fact is with respect to that?

A. They were not there when I was there.

Q. Mr. Brown there has been some testimony about the necessity of priming the engines of the Seminole. Will you tell us from your experience what necessity if any there was for priming the engines of the Seminole?

A. Well they were slow speed engines, air starter, and it was necessary to give them a little gas in the priming cups, which were furnished, one on each cylinder, to start the engines whenever I started up from a cold start.

Q. Was it necessary to prime them when they were warm or hot?

A. No I don't remember ever priming them when they were hot.

Q. Did you find it necessary to prime them when they were hot?

A. No, sir.

Q. Now with respect to priming those engines, how much gasoline would be required or be used to prime a single cylinder?

A. A teaspoonful would be sufficient, possibly be more than enough.

Q. What did you use to prime the cylinders with?

A. An ordinary squirt can.

Q. What was the capacity of that squirt can?

A. Between a half and a pint; possibly a half pint would be nearer to it.

Q. And how many primings could you get out of a squirt can of that size, for the engines of the Seminole, when it was necessary?

A. Well I don't know as I ever measured or counted the number of times, but I would say, several starts.

Q. Several starts out of one canful?

A. Yes.

Q. Did you have two cans, two squirt cans in the engine room when you were there?

A. Two—

Q. Squirt cans?

A. Oil and gasoline; I only had one gasoline can.

Q. In connection with that work at Merrill-Stevens in the summer and to the end of the year in 1927, can you tell me whether the cabin on the after upper deck was built at that time?

A. No it wasn't built at the same time we did the bottom work.

Q. When was it built, do you know?

A. I couldn't give you the date, but it seems it was the summer previous.

Q. Was there any cabin built on the Seminole in connection with this work at Merrill-Stevens that year, 1927?

A. No I don't remember any.

Q. Have you made trips on the Seminole to the Pilkington Boat Yard at Fort Lauderdale?

A. Yes, I think, one.

Q. And can you tell us approximately the difference from the mouth of the river to Pilkington's yard?

A. Three miles would be a fair estimate.

Q. Do you know a place there called the Bend,—referred to as the Bend?

A. Below town, or above town?

Q. Well I imagine it is below town.

Mr. Underwood:

I object to that as leading.

A. Well there is a Tarpon Bend below town, and there is another big bend; I don't know which one he is referring to.

Q. Let's call it the lower bend.

A. That is Tarpon Bend.

Q. That is above the mouth of the river?

A. That is above the mouth of the river just a short distance.

Q. Can you give us an estimate of the amount of gasoline that would be required to navigate the Seminole from the mouth of the river to Pilkington's Boat Yard?

A. Not over twelve gallons; I wouldn't think it would take that much; but I wouldn't say over twelve gallons,—depending on conditions.

Q. Why do you think it might take as much as that?

A. Just depending on how many times it ran aground, or how much handling they had on the bends.

Q. Now it has been suggested here, Mr. Brown that the construction of the Seminole was such that she was quite rigid, and was stiff, and would not have much motion in her hull in a seaway. What can you tell us about that?

A. No motion in the hull? In the framing or the—

Q. In the hull or the framing; in the structure of the vessel.

A. Well, sir I have seen her in a blow when the Captain and myself were the only two that stayed with it; the rest of them were so seasick on account of motion that they couldn't stand it; and the cabins would be weaving to such an extent that you could see the movement, especially the forward deck house, which we called the music room.

Q. Well in ordinary operation, laying aside storm conditions, can you tell us whether that would be noticeable to any extent?

A. No I don't say it would weave in ordinary conditions; but where you would really get a roll and a pitch, you could notice it.

Q. Can you tell me whether or not there were any noticeable vibrations from the engines of the Seminole when they were in operation?

A. I wouldn't say, from the engines, any more than from the entire vibration set up by the engines, you could feel it through the entire hull of course—through the entire ship.

Q. Did you notice any effects on the equipment in the engineroom, from the vibration you have spoken of?

Mr. Underwood:

I object to that as calling for a conclusion.

Mr. Matteson:

Talking about observation.

(The question was read by the reporter at the direction of the Court.)

The Court:

I overrule the objection.

A. Well sir we did have quite a number of little jobs come up, which could be attributed to vibration; such as loose joints, such as that.

Q. What do you mean by loose joints? Loose joints where?

A. First one place and then another; you would have water piping and gas piping and exhaust pipes, and such as that. It is part of the engineer's job to keep up with that stuff, and at times it got to be quite a job.

Q. I think on your previous examination Mr. Brown you told us the extent of your experience on gasoline boats. Will you tell us, from your experience, whether or not it is a common thing in gasoline boats to find it necessary to tighten piping, including fuel piping, against looseness or leaks?

A. It depends a great deal on the installation. In the average boat you don't have that trouble.

Q. Did you have that on the Seminole?

A. Yes.

Mr. Matteson:

That is all.

Cross Examination.

By Mr. Underwood:

Q. What kind of engines were they Mr. Brown?

A. They were Wintons.

Q. How big were they?

A. Rated at 125 horsepower each.

Q. Do you remember the size or weight?

A. No, sir, I can't remember the exact bore and stroke on those engines.

Q. Do you know how heavy they were?

A. I do not.

Q. Remember how many revolutions they made at full speed?

A. They made around 360 to 70, full speed, with the wheels we had on her when I was on her.

Q. Would it be eight inch bore?

A. Would be—?

Q. Would it be?

A. I couldn't say if it was eight or nine. I don't have the exact specification of them at one time, but that has been quite a while ago.

Q. Is that about right?

A. I would imagine that is a little bit under, if anything. It may have been a nine inch bore, if we were just guessing at it.

Q. How about eleven inch stroke? Is that about right?

A. Yes it could have been a twelve inch stroke; it is quite a throw.

Q. Would you say that they weighed about 10,000 pounds apiece?

A. I wouldn't say; I have got no way to estimate the weight.

Q. You are not familiar enough with such engines to approximate their weight?

A. Well I don't say that I am not familiar enough, but I wouldn't make a guess at the weight of those engines, not knowing the weight of them.

Q. Do you want to say whether 10,000 pounds was approximately right, or do you know?

Mr. Botts:

I object to repetition; he has answered the question once.

The Court:

Well he is on cross examination; he is testing his knowledge. I will overrule the objection.

A. Well that would be about five ton of engine, ten tons complete. Why if we want to get at the weight, why we are guessing pretty close. That is all I could say.

Q. Were they good engines?

A. For their time of being built.

Q. Was there any better engine at that time?

A. I don't believe there was.

Q. Now in ordinary operation in Florida waters, while you were on the Seminole, did you observe any movement of the cabins on deck when she was going up and down?

A. Ordinary operation?

Q. Going up and down the Miami River?

A. Oh no, no.

Q. Up and down Biscayne Bay?

A. No.

Q. Going down to the Keys, fishing?

A. No, sir.

Q. That was something that happened under what kind of circumstances?

A. In a seaway.

Q. Now you spoke about this after cabin being installed; do you think that was in the summer of what year?

A. I think, as you ask, it was in the summer of '26. It seems to me that it was put on before we made the trip to Andros Island, which was made in July of '26.

Q. Where was that done?

A. Merrill-Stevens, as I remember it.

Q. What else was done there at that time?

A. Sometime during that change-over; without having the exact dates, the cabin space below was all rearranged.

Q. Anything else that you remember?

A. In the line of work at any time, you mean?

Q. No; anything else that you remember was done about the time this after cabin on deck was installed?

A. Well it seems that it was along about that time, which may not be the exact—the same job, the forward deck house was changed a little bit; it seems it was lengthened, forward, but I don't remember the exact date on that.

Q. I don't quite understand what it was that was lengthened Mr. Brown.

A. The forward deck house.

Q. Any other work done at that time, that you recall?

A. The only big job that I recall. There was a boat deck put on there in the place of the old canvas awning, sometime about the time that work was done; whether that was done at Merrill-Stevens or Palm Beach, I can't recall.

Q. What was the shape of the water tanks?

A. There was three water tanks, rated at 500 gallons each, that were approximately three feet high, and whatever size it will take to make about 500 gallons; which was seven or eight feet one way and three of them fit in the forward bilges.

Q. They were flat bottoms and flat tops?

A. Flat bottoms and tops and sides.

Q. Rectangular tanks?

A. Yes.

Q. Were there any cylindrical water tanks?

A. No, sir.

Q. Do you know of what the deck over the tank compartment is made?

A. No; the floor of the Captain's room was wood, which was over it; and the deck on either side was wood; canvas covered.

Q. Do you know whether that was set on steel, or not?

A. No I can't say.

Q. What was the Seminole's crew doing at Merrill-Stevens when she was there the summer of 1927—and fall?

A. Chipping rust; cleaning up in general.

Q. What else besides chipping rust and cleaning?

A. Painting inside, as the job got farther along.

Q. What else?

A. Well I don't know of much else they could do.

Q. Were you on her?

A. Yes, sir.

Q. The whole time?

A. Yes, sir.

Q. Quite sure about that?

A. Yes. If I hadn't been I wouldn't have said so.

Q. Well do you remember what you testified about when you first came on the stand last March, about the time you left the Seminole?

A. I came back the next day and corrected that, if I remember, sir.

Q. I didn't ask you that.

A. Well I am answering you that way. I said I left her in '27, and I remembered when I got home and checked up and found it was '28; and I came back the next day on the stand, after that, and said it was '28 instead of '27. Now that was not done to cover up anything.

Q. Why do you say that?

A. Because you led me on to it, the way you asked the question, I didn't understand it.

Q. I led you on to what?

A. Do I remember what I said?

Q. What did I lead you on to?

A. You make out like I left her in the summer of '27. the way I understand it.

Q. Well did you?

A. I did not. You will find that on the record, that I came back and corrected it.

Q. But you first testified you left her in '27, in the spring, did you not?

A. You have got that record; I don't know what I said, now.

Q. Do you remember? Do you remember?

A. Do I remember what, sir?

Q. Will you read the question?

(Preceding question was read: "But you first testified you left her in '27, in the spring, did you not?") //

A. I don't remember whether I said, spring or summer, but I said I left her in '27.

Q. And you came back the next day and said '28?

A. I did.

Q. The first time you were wrong by a year?

A. Which is a very easy mistake to make.

Q. Couldn't be mistaken about the removal of these gasoline tanks, though?

A. No, sir.

Q. Couldn't be mistaken about that?

A. No, sir.

Q. You were there all the time?

A. I was there all the time that job was under way.

Q. When did the job begin?

A. I couldn't give you the date exactly.

Q. Well, about.

A. It was during the summer, some time.

Q. And when did it end?

A. Late in the fall, some time.

Q. Were you still on her when the job finished?

A. Yes, sir.

Q. Where did she go from Merrill-Stevens?

A. Darned if I know. We went down the river and we laid off of Seybold's place for awhile; and we made cruises, and we came back to Seybold's; and I don't know where we did go.

Q. Where was she when you left her?

A. At Seybold's.

Q. What was the occasion of your leaving?

A. That might bring on talk, but I don't mind talking. The Captain fired me, and I went down to the office to find out why I had been fired, and they says "Why somebody must be crazy; you are not the one that is fired, it is him that we are after". I says "Well I am fired, anyway". And they told me to go back home and sit easy and not pay any attention to it.

Q. Who told you that?

A. Mr. Simmon and Mr. Scott. So I went back home, and they notified me in a day or two to meet Captain Willie Baker down there at a certain time during the day about lunch time and Captain Nelson would be gone. Several days after this—after I was fired. I went back and met Willie Baker, and Mr. Simmon was there, and put Captain Nelson ashore with his bag and baggage. Without any warning he turned to me and told me "Now you and Captain Baker are in charge of the boat"; so I went back aboard, and with the understanding that I had a job from then on. Nothing against me whatever, and they had everything cleared up. And in a week or so after that, Willie Baker and his boy and my boy, several of Willie Baker's friends,—I don't know how many, and myself, took the boat to Lauderdale, tied her up at Pilkington's.

We got up there and left her there, and we all came back. And I went back the next day; I think Captain Baker went back with me; we went up there and started laying her up.

Q. That was in 1928?

A. '28. We started laying the boat up in Pilkington's shed. We took down one of the masts, or maybe—yes; and backed her into the shed.—No, we headed her in the shed that time; and I stayed on her for about a week, laying up, with the understanding I was to be with her. And Willie Baker and Mr. Simmon came up there I think it was a Saturday, told me to pack up and get ready to go to town with them. So we went right on to town and they paid me off. So I didn't know what it was all about, I couldn't find out what it was all about, and I requested an audience with Mr. Scott; and they would not tell me anything, and wouldn't even let me see Mr. Scott.

Q. Did you ask Mr. Simmon what it was about?

A. Yes, sir; he didn't know.

Q. What did he say?

A. He didn't know.

Q. Did he say he didn't know?

A. He said he didn't know.

Q. You tried to get to see Mr. Scott?

A. I tried to get to see Mr. Scott, and Mr. Scott was always too busy to see me.

Q. You never did see Mr. Scott?

A. Not after I was let out.

Q. Well this work at Merrill-Stevens in 1927 as you remember it, began in the summer and was completed in the fall, is that right?

A. Late in the fall, I would say; I don't remember just what month.

Q. I don't want to get into a quarrel with you about when fall ends and winter begins; but, about when?

A. It seems to me we were off by Christmas, but I am not sure.

Q. Do you remember whether you were still there at Christmas?

A. No I couldn't say.

Mr. Underwood:

That is all.

Mr. Matteson:

That is all.

(Witness excused.)

4049 Thereupon: GEORGE F. KLEIN as a witness on behalf of Libelants, in rebuttal, was sworn and testified as follows:

Direct Examination.

By Mr. Matteson:

Q. What is your full name?

A. George F. Klein.

Q. What is your occupation?

A. Iron worker.

Q. And how long have you been engaged in that occupation?

A. About fifteen years.

Q. And who do you work for now?

A. A. L. Hardie, Hardie's Iron Works.

Q. What other concerns have you worked for?

A. G. M. Dykes; Coral Way Iron Works; Hull-Molton; Arrigoni.

Q. When you say, iron work, what does that include?

A. Well general blacksmithing; general repairs on everything; welding, acetylene, electric.

Q. Soldering?

A. Soldering.

Q. Do you operate—do you do punching of plates?

A. Yes, sir.

Q. Drilling?

A. Drilling.

Q. All kinds of iron work?

A. That is right.

Q. Do you work in copper and bronze, too?

A. That's right.

Q. Are you familiar with tank work, too?

A. Do a little of it yes, sir.

Q. Did you accompany us with the Court when we went out to the Seminole in October of this year?

A. I did.

Q. And did you observe the tank that had been removed, in place, and laid on its side at the forward part of the Seminole?

A. Yes.

Q. What did you observe with respect to that tank, with respect to solder?

A. Well I noticed it had been soldered up maybe about eighteen inches on the side there; and solder in places on the bottom.

Q. Well now was there any evidence of solder above the eighteen inch place that you speak of, on the side of the tank?

A. No I couldn't say that there was.

Q. It has been suggested here that there may have been solder on the side of the tank above that place, on the side, and that it was caused to run off by the heat of a fire through which this tank went. Will you tell us what you know about the effect of heat in removing solder from a soldered surface?

A. If they had been soldered all the way up, it would have shown signs of solder on it yet.

Q. Why was that?

A. Because in my cases where I remove solder, you have to use a steel brush, with heat, to remove the solder.

Q. What do you mean by heat?

A. With a torch.

Q. You mean that you attempt to remove it with a blow torch?

A. That is right.

Q. You have to use—

A. A steel brush in order to knock it off, when it is hot.

Q. In other words, it does not run off readily?

A. No.

Q. By that, do you mean that none of it comes off, or that you can't get it all off?

A. Well yes some of it will come off, but you still have your tinning on there; you have to tin it first in order to solder it.

Q. And is that what you have to remove with a wire brush?

A. Well a certain percentage of that yes, sir.

Q. You spoke of soldering, that you observed in the bottom seam of the tank. Tell us just what you observed there.

A. It was soldered in places; it wasn't soldered completely around.

Q. You mean the solder wasn't there when you observed it?

A. That is right.

Q. How extensive were the places where solder wasn't there?

A. What is that?

Q. How extensive were the places where solder wasn't there?

A. Well there was places that would average two and three inches there, that wasn't soldered.

Q. Did you notice the rivets around the bottom seam of the tank, as to whether they had been soldered or not?

A. No I don't think they were.

Q. Did you measure the tank compartment space there, the width of it from one end of the ship to the other?

A. Yes.

Q. To see the clearance of the tanks in that space?

A. About a half inch.

Q. On each side?

A. Yes, sir, at most a half inch.

Q. What is that?

A. I say, at the most, about a half inch.

Q. Now will you tell us whether there is any difference in appearance between welding and soldering? I am talking about fresh work, now.

A. Soldering would have a bright color to it; where your welding, if you are welding two pieces of iron together, you have the same color as iron.

Q. Is there any other difference in appearance between solder and welding?

A. You would have a bright color and a dark color.

Q. Any difference in the surface that is produced,—the kind of a surface that you get?

A. Why you would have a rolled edge if you weld it.

Q. What do you mean by a rolled edge?

A. What we call a bead; you would have a bead on there,—a rough bead on there.

Q. A rough bead?

A. Yes, sir.

Q. It wouldn't be smooth?

A. No.

Q. And solder—

A. Soldering would be smooth.

Q. Is there any difficulty in telling the difference between soldering and welding?

A. No, sir, anybody can tell the difference.

Mr. Underwood:

I move to strike that out, what anybody could tell. I don't think I could.

Mr. Matteson:

That is a kind of an expression, if your Honor please, that expresses the witness' view on that subject.

The Court:

It is clear enough to the Court, but it may be subject to a technical objection. I will strike it.

Q. Was there any welding on the tank, that you observed?

A. No.

Q. Had the tank been caulked, could you tell?

A. No it hadn't been caulked.

The Court:

You mean this difference is plainly visible?

A. Beg pardon?

The Court:

The difference between soldering and welding is plain to see; is that what you mean?

A. Well it is plain to see. Soldering, why it shows up more or less like nickel plating; and welding, you have the same appearance you have in your tank. You can take a pocket knife and cut soldering off; where you couldn't if it was welded. Take a piece of glass and scrape it off, for that matter.

(By Mr. Matteson):

Q. Have you ever done soldering on a steel tank?

A. No, sir.

Q. Of this size?

A. No, sir.

Q. What is that?

A. No, sir.

Q. In your opinion, would soldering be practical on a steel tank as large as that?

A. I would say no; not on a tank.

Q. On a steel tank?

A. No.

Q. Why do you say that?

A. Well it is never recommended. If it was on brass or copper it would be different.

Mr. Matteson:

That is all.

Cross Examination.

By Mr. Underwood:

Q. You say you are employed by Hardie's?

A. Yes, sir.

Q. What is your job there?

A. Well I am more or less looking after all the work that comes in there.

Q. I am sorry, I am having difficulty in understanding you:

A. I look after more or less all work in the shop.

Q. You mean by that, that you do it yourself?

A. Yes, sir.

Q. You handle the tools yourself?

A. That's right.

Q. And you work for him at a weekly wage?

A. Yes, sir.

Q. Does he have a foreman in the shop?

A. Well no; that is what I say, I more or less take care of that end of it. I am not considered foreman, but I look after his business. He is in and out.

Q. Hardie himself is the boss?

A. That's right.

Q. Any other people that work in that shop?

A. Yes, sir.

Q. How many?

A. Well sometimes we have four, and sometimes as high as fourteen or eighteen.

Q. You work with those fellows?

A. What is that?

Q. You do the work with those other men?

A. Yes.

Q. In other words you are a workman and not a foreman, is that right?

A. Yes.

Q. Did you ever make a galvanized iron tank?

A. No, sir.

Q. Did you ever test one?

A. Test water tanks; no gas tanks.

Q. Never tested a gasoline tank?

A. No, sir.

Q. Ever test a galvanized iron tank out of a boat?

A. No, I wouldn't say out of a boat; no.

Q. Have you had any experience working on boats?

A. No, sir.

Q. You haven't done any work on galvanized iron gasoline tanks?

A. No, sir.

Q. When you apply solder, what tools do you use?

A. Use a soldering iron.

Q. That is the only tool?

A. The only tool, yes.

Q. What else do you use?

A. Use acid.

Q. And what else?

A. Solder.

Q. You clean it off with acid, first?

A. Clean with acid first.

Q. Then you put the solder and the soldering iron together on the spot?

A. That is right.

Q. What kind of soldering iron do you use, now?

A. Copper.

Q. Where does it get its heat?

A. Heat it with a fire; have a blow torch.

Q. You heat it with a blow torch?

A. That is right.

Q. And then you use it for awhile until it cools off?

A. That is right.

Q. You have seen these electric soldering irons haven't you?

A. Yes, sir.

Q. You can plug them in in any 110 volt circuit; is that right?

A. That is right.

Q. It does not take a great deal of heat to melt the stuff, does it?

A. No, sir.

Q. Did you ever calculate how much heat?

A. No I wouldn't say. I would say about 450 degrees.

Q. Is that part just a guess, or have you ever approximated it with a thermometer or any device?

A. No I haven't; only a guess.

Q. Now have you tried to take solder off with a blow torch?

A. Yes, sir.

Q. And how big a flame does the blow torch shoot?

A. Not a blow torch; acetylene torch.

Q. Have you ever punched a rivet out, burned a rivet out with an acetylene torch?

A. Yes, sir.

Q. How big a flame does that torch make?

A. According to the size rivets you are cutting out.

Q. What is the biggest flame you have ever seen,—normally I mean, from an acetylene torch?

A. That long. (Indicating.)

Q. How big around? As big around as my pencil?

Mr. Matteson:

About three inches.

Mr. Underwood:

Three or four inches. I was thinking more of diameter.

A. You are talking about—welding and cutting is two different things. When you weld,—when you are cutting you only have a flame about like that.

Q. What I am thinking about is the flame you may have to use in melting solder.

A. Oh, in melting solder you use a blow torch, not a cutting torch.

Q. How big a flame do you get from the welding torch?

A. Well you can use any kind of a type you want to, on that. Use a flame say a half-inch long; because it does not require an awful lot of heat.

Q. What is the biggest you have ever used?

A. Oh I would say around three-quarters to maybe an inch.

Q. And how big around is that flame?

A. Well that would run from a quarter of an inch on down to a point. It tapers out as you come up.

Q. You mean the biggest diameter of that flame would be a quarter of an inch?

A. Yes.

Q. That does not heat much of the metal surrounding the point where the flame is put, does it?

A. Beg pardon?

Q. That doesn't heat much of the metal around the place where the flame is directed, does it?

A. Well I should say it would heat up to two and a half inches, if you want to get it heated; because you have to work the torch back and forth.

Q. The reason you say solder does not run off except with a wire brush, is because it runs away from the place where you have your flame and gets cool and solidifies again out on the margin; is that right?

A. No I wouldn't say that.

Q. Isn't that what it does?

A. No it will drop right off.

Q. When it runs down the side of the tank—assuming you are burning—

A. No it won't run down the side of the tank, because there is no place for it to hit.

Q. You think not?

A. No, sir.

Q. What is it of the solder, that stays on the tank, that you have to brush off with the wire brush?

A. When you are doing any kind of soldering, you have got to do what you call tinning your iron first. In other words, you have got to put a light coat on the surface.

Q. Light coat of what?

A. Solder, on your surface. When you get your metal good and clean, you have got to put a light coat on there first before you can get the rest of it to stick.

Q. First you put a light coat of solder?

A. That is right.

Q. Then you put some more solder; is that correct?

A. That is right.

Q. When you put your flame on there, what is it that stays?

A. The tinning will stay on there.

Q. The first one will stay on there, even against the flame, will it?

A. Yes, sir.

Q. That is pretty tight stuff then isn't it?

A. Oh yes.

Q. Stand a lot of pressure?

A. Well I wouldn't say it would stand a lot of pressure, no. I haven't really checked it.

Q. Have you ever soldered a cylindrical tank?

A. A which?

Q. A cylindrical tank.

A. No.

Q. Ever burned the solder off of a cylindrical tank?

A. No, sir.

Q. You were on the Seminole last month, and you saw this tank when the rest of us were out there, and you looked at the bottom?

A. Yes.

Q. And you saw the place where the end of the bottom plates, and the end of the inverted crown in the bottom—

A. That is right.

Q. Met, more or less?

A. Yes.

Q. Did you observe that they did not, one come down as far as the other?

A. Yes.

Q. You observed there was a little angle between them?

A. Yes you could put your fingernail in there some places.

Q. Now is it your recollection that there were some places in that angle that had no solder at all?

A. Yes, sir.

Q. Are you quite clear about that?

A. Yes, sir.

Q. Absolutely no solder at all?

A. No solder.

Q. You don't mean that there were no plates—that there were merely some places that had more solder than others, or less than others?

A. I would say there was some places where there had been no solder.

Q. Where did you take any measurements of the tank compartment?

A. On the west side of it.

Q. Which side would that be?

A. On the opposite side to where we got on the boat.

Q. And from what point did you measure?

A. Right down at the bottom; where the boat stopped off, rather.

Q. Well between what points did you measure?

A. Measured the inside of her.

Q. Where did you have to get to, to make that measurement?

A. Down inside.

Q. What did you use to measure it with?

A. A rule.

Q. What kind of a rule?

A. A six-foot rule.

Q. What type of six-foot rule was it?

A. It was a steel rule.

Q. A steel rule?

A. Yes; combination steel and aluminum, I think-- alloy.

Q. It wasn't one of these wooden folding rules?

A. No, sir.

Q. Did you measure the distance between the tank and the bulkhead itself?

A. No; that was a hard proposition to do, because the tanks looked like they had been moved.

Q. I show you a photograph, Exhibit 5-J; is that the space you were in?

A. Here is the space I was in, right along here.

Mr. Underwood:

The witness indicates on the blueprint Exhibit A, the same space shown in Exhibit 5-J:

Q. Is that right?

A. Down inside, right here.

Mr. Matteson:

He indicates the space between the port tank and the port side of the ship. I don't know whether he is satisfied yet that this is the same, or not; but I will agree that it is.

A. Right down at this point here.

Q. That is all right. Well now the testimony in this case is, and I will ask you to assume that this photograph, Exhibit 5-J, is a photograph of that space which you have just pointed out on the blueprint:

A. Yes, sir.

Q. Can you show me on that photograph the points between which you measured?

A. No, I don't see them.

Mr. Matteson:

Does the witness understand this is looking down?

Mr. Underwood:

I was afraid to tell him that.

Q. This is a photograph, Mr. Witness, taken looking down. This white object at the bottom is Number One tank; it is the side of the tank, which I now show you on the blueprint Exhibit A.

A. There is two angle uprights right in this corner here where your plates, bolt or rivet to; I didn't notice what they did. I took the distance from where the two angles was fastened on to the plates, right across at this point. I can't see the angles there at all.

Q. I call your attention to the corner on this photograph.

A. I see it now. I didn't see the way it was.

Q. Here is another angle right here.

A. I measured right against the side of this ship, across these two angles here, from the plate.

Q. From the plate to where?

A. Over there. From the plate, not from the angle; from plate to plate.

Q. Now do you orient yourself? Do you recognize this picture here as the place where you were?

A. I see now; but I don't see the other angle over here.

Q. Indicating the forward part?

A. That is right.

Q. You say you measured from the plate at the left-hand side of the picture, adjacent to the angle?

A. That is right.

Q. Over to a similar point on the other side?

A. To a plate over there.

Q. What measurement did you get?

A. I am pretty sure it was forty-two and a quarter inches; I wouldn't be positive.

Q. Well what is your recollection about that?

A. I will say forty-two and a quarter inches.

Q. Well your testimony and answer to Mr. Matteson's question didn't give us that measurement; it gave us a clearance. You didn't measure the clearance direct, did you?

A. That is what I say, you couldn't measure the clearance direct, because that was buckled up there.

Q. Whether you could or not, you didn't?

A. That is the only point in the ship where you could really measure the inside of that space there.

Q. Whether you could or not, you didn't measure the actual clearance itself did you?

A. No, sir, because that was buckled up; you couldn't.

Q. Did you measure the diameter of the tank?

A. I measured it but I couldn't say what it was, now.

Mr. Underwood:

That is all.

Re-Direct-Examination.

By Mr. Matteson:

Q. Let me get this clear. You said that you measured and reached a result, and the clearance was half an inch on each side?

A. Yes.

Q. How did you get at that? Just what was your process?

A. Well I measured the tanks, but I can't recall just exactly what the tank was.

Q. And then you measured the space?

A. Yes.

Q. And how much difference was there between them?

A. Well I figured it out where you would have a good half inch; about a half inch clearance.

Q. Well you mean there was twice that difference between the diameter of the tank and the width of the compartment?

A. Why you wouldn't have—there wasn't an inch difference between the tank and the space, is what I am getting at. I don't recall exactly what the tank measured, but I know there wasn't an inch difference between the tank and the space.

Q. Did you notice the size of the rivets in the tank?

A. Three-eighths.

Mr. Underwood:

I object to that; not proper re-direct.

The Court:

Well I will overrule that.

Q. Was there any difference in the size of the rivets on the side and the bottom of the tank?

A. I will say there was. They seemed to vary. It is hard to say.

Q. I mean, the size of the rivets.

A. Oh no, the rivets were the same.

Q. Three-eighths?

A. Yes, sir.

Mr. Matteson:

That is all.

Re-Cross Examination.

By Mr. Underwood:

Q. You say you measured the tank?

A. I measured the tank but I can't recall exactly what the measurement was, now.

Q. Which tank?

A. I measured the tank that was laying down on the side.

Q. Where did you measure it?

A. At the bottom.

Q. You don't remember the measurement?

A. No I wouldn't say the exact measurement; I can't recall.

Q. Did the heads of the rivets measure three-eighths inches across?

A. Oh, no.

Q. What measurements did you get on the heads?

A. Well they vary, because they were hot,—put in there hot.

Q. It is your opinion that they were three-eighths?

A. That is right.

Mr. Underwood:

That is all.

(Witness excused.)

Mr. Matteson:

If your Honor please, I have come to a point where I have got to ask the privilege that has been asked before, on other points in this case. I have a small point that I want to establish in the record, but the only two witnesses who can establish it are Mr. Dyer and myself. We hate, either of us, to be obliged to retire as counsel in the case, but I would like to call Mr. Dyer to testify on this point

at this time; if there is no point to be made on the ground that counsel are involved.

Mr. Underwood:

Certainly not.

4068 Thereupon: DAVID W. DYER as a witness on behalf of Libelants', in rebuttal, was sworn and testified as follows:

Direct Examination.

By Mr. Matteson:

Q. Mr. Dyer what is your profession?

A. Lawyer.

Q. Are you a member of the Bar of the Sstate of Florida?

A. I am.

Q. And a member of the firm of Batchelor & Dyer, of counsel in this case?

A. I am.

Q. I show you Libelants' Exhibit 78 for identification, also known as Phipps' Exhibit Z, which was offered in evidence in connection with the testimony of Mr. Hawkins on May 9, 1939; and ask you if you saw it on that date?

A. I did.

Q. This exhibit was also referred to in the testimony of Anderson on May 12. Will you tell me what observations you made in respect to this exhibit, between those dates?

A. I made an observation that one night between those two days, you had taken this particular exhibit to your hotel room, and during the evening both yourself and myself went through the exhibit in detail, and at that particular time the first two sheets of the exhibit did not contain any initial over the line, Entered, either on the

first page or on the second page; and the two sheets further down, dated I believe June 22nd, 1935, did not have any initials above that line.

Q. Did you again observe this exhibit on May 12, at the time Mr. Anderson was examined with respect to it?

A. I did.

Q. And what did you observe in respect to it at that time?

A. I observed that on the first and second pages, above the line marked Entered, the initials E. J. A., or whatever they purport to be, were there,—were on it at that time.

Q. On both the first and second pages, vouchers 103 and 102?

A. Correct.

Q. Was any record made, that you know of, with respect to the signatures appearing on the various sheets of that exhibit?

A. There was.

Q. Will you tell us what that was?

A. Before we sent that exhibit over to Mr. Underwood's room, on the evening that we were looking it over, you made a record of the individual sheets, and specified on that record where they were signed, where they were not signed, where they were entered, made, approved, and so forth.

Q. I show you this document, Libelants' Exhibit 109 for identification, taken out of this envelope; ask you whether you can tell me what that is?

A. That is the schedule that was made up by you at that time, that night, in which it was signified what were on these individual sheets of this exhibit.

Mr. Matteson:

That is all.

Mr. Underwood:

Mr. Botts?

Mr. Botts:

No questions.

Cross Examination.

By Mr. Underwood:

Q. Did you check Exhibit 109 for identification, against the vouchers themselves, Mr. Dyer?

A. You mean, did I check this against this?

Q. That is right.

A. I did not, that night.

Q. Did you at any time before Mr. Anderson testified?

A. No, sir.

Q. Did you make any personal memorandum of your own?

A. I did not.

Q. What you say is, as I understand it, that the initials E. J. A. opposite the word, Entered, on voucher 103, were not there when you first saw it?

A. That is correct.

Q. You say the same thing about exhibit—about voucher 102, voucher 101 and the first page of voucher 100; is that right?

A. No.

Q. You tell me what is right.

A. I say the initials did not appear on voucher 103, which is the top voucher; nor on 102, which is the next voucher; nor on two others farther down, under the date I think of June 22, 1935; this voucher, and this voucher.

Q. The last two that you refer to on which no initials appeared, are the two pages constituting voucher 96, is that right?

A. Yes, sir.

Q. 97, 96?

A. That is right.

Q. Now of course on voucher 96 there aren't any initials today, are there?

A. No, sir.

Q. Then the only changes that you say you observed in these vouchers are on 103 and 102?

A. That is correct.

Q. Could you be mistaken about any part of that?

A. I don't believe so.

Mr. Underwood:

I just wish I could get the tone of your voice in the record.—That is all.

(Witness excused.)

Mr. Matteson:

If your Honor please, if I may take the stand and let Mr. Dyer examine me.

Mr. Underwood:

Why don't you just state it on the record; would your testimony be substantially the same as his?

Mr. Matteson:

Substantially the same.

Mr. Underwood:

I will stipulate on the record that Mr. Matteson's testimony would be substantially the same as Mr. Dyer's on that point.

Mr. Matteson:

There is just this much about it; Mr. Underwood seems to think there was something inconclusive about Mr. Dyer's last statement. There is nothing I ever was more sure of in my entire life than I am sure of this; and if there is going to be any comment made on that point, why I would want to have the privilege of testifying.

Mr. Underwood:

Place that on the record, if you like; I don't mind. You can be sworn and testify if you want to.

The Court:

Whatever you say.

Mr. Underwood:

I am perfectly content to put your statement on the record, and say that would be your testimony; whatever you want to do.

Mr. Matteson:

All right. Then if your Honor please, I would like to add this much, if it is agreeable to Mr. Underwood: that I did actually make this memorandum and checked as I made it, and made certain of its accuracy; and also that the entries in the first column thereto related to initials or lack of initials opposite the word Entered. Initials in the second column refer to the space immediately beneath, headed Detail Posting; in the third column, refer to whatever appeared opposite the legend, Made by; and the final column, whatever appeared opposite the words Approved by, on the voucher. That dashed lines were used to indicate blank spaces; and that with respect to the first two, the stars indicated my emphasis at the moment, of the lack of any signatures at all appearing on the first two sheets,—vouchers 102 and 103.

Mr. Underwood:

Maybe we can shorten that a little bit: those are the only two discrepancies that you noted?

Mr. Matteson:

Yes.

Mr. Underwood:

You will remember Mr. Anderson said that he initialed this one, the top one, as I recall it?

Mr. Matteson:

That is correct; he finally admitted that he did that, and denied positively that he did the second one on 102.

Mr. Underwood:

That is correct.

4074 Thereupon: JOHN A. THOMPSON was recalled as a witness on behalf of Libelants', in rebuttal, and further testified as follows:

Direct Examination.

By Mr. Matteson:

Q. Mr. Thompson you have already testified as to your qualifications and your experience, so I will just ask you if, as part of your experience, you have had occasion to examine and analyze bills for repairs on work on vessels?

A. I have sir.

Q. And how much experience of that kind have you had?

A. Well it has been more or less continuous all through, even up to today.

Q. Have you had a great deal of that to do?

A. Oh yes, considerable.

Q. Have you examined repair bills relating to the work on the Seminole in 1927, which has been marked as Exhibit 4-L and 4-M?

A. I examined photostatic copies of them.

Q. You did your work from photostatic copies?

A. Yes, sir.

Q. You have those copies, have you?

A. No, I can have them here in the morning; I left them at the hotel.

Q. Will you tell us Mr. Thompson, in summary form what you find as an analysis of these bills, was the work that was done on the Seminole, as represented by those bills?

A. Well generally speaking, I didn't pay much attention to the prices. I separated the bills, went through them at great lengths, and I found that there were 724 designated items totalling 14,646 hours.

Q. That refers to labor items?

A. That is labor and material—no, that is labor items; that is right, labor items. I may say that possibly it would be—to be meticulously correct, 723; because there was one item that I took the liberty of incorporating in there, because it seemed obvious to me it was merely an omission on the part of the stenographer, because there were similar items before and similar items after; but the actual items then would be 723, if you wish. Of the none-designated items I found six, totalling 48 hours; that is with the exception of the items I have just mentioned.

Q. What are the items you just mentioned?

A. I haven't that note here; I could let you have that in the morning, with the details.

Q. When you say, designated, what do you mean?

A. That is that the labor item has specified against it the purpose for which the labor was used.

Q. Yes.

A. The comparison of that is for each hour not designated, 304 hours designated, or roughly about one-third of one percent of the labor items were not designated. On the whole I think that bill was particularly well itemized, and fairly clear for anyone with reasonable experience to go through and check it.

Q. Well now by going through and checking up, can you give us an analysis of the work represented by those bills as they stand?

A. I haven't analyzed them as to prices, at all. What I did, I checked to see if they had designated small items; for instance, there were 48 labor items less than two hours, each with a designation; and I won't give you the whole range; but there are three items with as low a charge as half an hour, and those are designated. The labor items were particularly well marked out as to the job the labor was spent on. And that covered these 48 labor items, each less than two hours, covering ten separate trades. So I concluded that as it was not one particular charge, it was a good many. I see particularly the whole of the trades in it, it meant the large items were just as carefully kept. Then there were 716 items, labor or materials, each less than \$1.00; and that seems a fairly good split-up as to the price. There are 60 items of labor and materials each less than ten cents, the lowest being an item for two cents, which is quite a cut of a bill. It seems on the whole the bills were excellently designated as to the work they cover,—the part of the work. I then checked up the rivets; there were 2261 pounds of rivets charged, and no three-eighths rivets of any quantity were supplied at all. All these rivets were half-inch or five-eighths.

Q. Could rivets of that size have been used on the gasoline tanks of the Seminole?

A. No, sir.

Q. Why not?

A. They are too large for the lap of the tanks. I then checked up the zinc plates referred to in evidence; I find they were supplied and machined in two separate batches; the first batch was charged upon September the 2nd, in a quantity of 96 pounds, and the machining on that first batch was finished on September the 9th. The second batch was charged up on October 22nd, some six weeks later, totalling in weight,—amounted to 79 pounds; that was the material on the 22nd, and the labor on that item

was finished on the 25th. That gives a total of zinc plates of 175 pounds.

Q. If the plates averaged four to five pounds apiece, how many plates would that make?

A. Well if they had an average of five, the larger figure I think, mentioned by Mr. Munroe, which I agree with as being a fair average of zinc plate for a boat of the size, that would actually mean 35 plates. I have analyzed the accounts for the account of welding rod used; there is a total weight, with the exception of a small item I think in November, of I believe a pound and a half, bronze welding rods,—I call them brazing rods,—of iron welding rods; a total weight of nine pounds. The first was supplied; that is a charge, it would be more correct to say, because I only refer to these bills,—it was charged on September 23rd, and that was of one pound, welding rods. I have the details of the rest if you desire them. I checked up the oxy-acetylene gas that was supplied; there was a total charge made of 3520 cubic feet of oxygen and 1545 cubic feet of acetylene; the proportion is approximately 2.28 cubic feet of oxygen to one of acetylene. There was none supplied from October—that is oxy-acetylene, supplied from October 26 to November 9, when 220 cubic feet of oxygen and 251 cubic feet of acetylene were charged. I checked up the patch bolts, which I noticed on the Seminole; I found that they commenced to deliver those on October 10th, that is just only four; the actual delivery of any of them in quantity commenced October 23rd. Total number used, 5313. The riveting was completed on the boat on October 25th, with the exception of four hours on November 2nd and three hours on November 3rd.

Mr. Underwood:

Sorry, Mr. Thompson; give me that first date; riveting finished when?

A. On October the 25.

Mr. Underwood:

Except what?

A. Excepting four hours on November 2nd and three hours on November the 3rd.

Mr. Underwood:

Thank you.

A. I then looked into the amount of electrical work that was charged. I have eliminated from the electrical work a certain item that appeared I think on the First or Second day; it appeared obvious to me was running wires for the purpose of carrying on the repairs. That was charged to the boat, but obviously it was not part of the boat; it was wires run for purposes of carrying on repairs. I have not included that work in these figures, your Honor. Electrical work actually in connection with the boat commenced on September 27th; two 40-watt bulb lamps supplied. On December 2nd, 12 feet of fixture wire. On January 4th, 8 feet of high-tension wire. The total cost of those three items amounted to \$2.12. I find no trace in the bills, of any other electrical work. About the engines, the work on the engines, a Maxini Silencer, that is an item apparently I should think for one of those smaller engines, was supplied, on August 30th, and labor was charged on September 1st. On October 1st an exhaust fan was supplied,—I don't know where for. But the only labor, engineer's labor charged in this boat, was charged up on October 26th and November the 18th. On the first date, five hours charged for machinist in the engineroom; the purpose is not stated, more than that. November 18th there is one hour charged, for drilling brasses. A total engineer's time on this job was six hours. I have more details, your Honor, but—oh there is the piping. As regards the piping, and fittings; there was no fuel pipe of any kind supplied, according to these bills; that is, from my reading of them. I have a com-

plete list here of all the piping and with the exception of—I haven't the details here, but I can bring the details. It was all water piping, with a possible exception of 3.89, but I am satisfied from items in that amount of 3.89, that that was also water piping, or plumbing piping of some order. The remaining pipe and fittings are all definitely rail fittings, stove pipe, exhaust pipe, or water pipe. Total labor 475.78, and total materials of 189.29, making a grand total of 665.07. I think that is all I have here at present.

Q. Aside from these few items, are you able, from your analysis of the bills, to tell us the general work that was done on the vessel?

A. Yes, sir. I have what I call sequence repairs; I don't wish to burden the record unduly, but I will do as much as you wish me to do.

Q. Don't go into too much detail, but the general picture reflected by the bills.

A. From the bills it seems evident to me that the renewal of the bottom was contemplated prior to April 29th, because on that date she was drydocked, hauled on the slipway, to get things ready; hauled on the slipway for measuring, at least. There is no boilermaker charge; but there is a foreman, one man, charged on several days; total hours 24½ hours for foreman,—not foremen; foreman and helpers, 130 hours.

Q. Will you go just a little bit slower, Mr. Thompson, it will be easier on the reporter.

A. On that particular occasion the Seminole was docked on May 3rd, and I assume that an estimate was given and an order placed, in some form, between May 3rd and June 13; because on June 13, plates, angles and rivets were charged to the yacht,—that is in considerable quantities. On August the 25 she was hauled out on the dock; there was practically very little work done on that day. The second day they started cutting out cement, cleaning the bilges. The carpenters started removing the

wood guard; that went right around the boat, if you remember. On the 27th the removal was completed, and on August 28th guard angles were removed. I was a little puzzled first when I looked at those bills, because there was some work done on side plating for three or four days, just about this period; and then the side plating disappeared. But from an item I think on August 28th, I have assumed that the boilermakers' labor charged for those three or four days,—I can get the actual date, from August 28th to September the 1st, was really the removal of the guard angles; because on one of the days the guard angles were mounted. On August the 29th they started cementing the bottom,—putting cement on the bottom, inside.

Q. Just tell me what is cementing the bottom, so we will know.

A. Well cementing the bottom is a mixture,—depends upon the builder; we generally use a fairly good mixture, about four to one sand; some people use a weaker mixture, some use a better mixture; if you are putting in a thin layer; if you have a thick, you may put in a richer mixture first, and finish off later on; that is a protection to the floor.

Q. That is on the inside?

A. That is on the inside; apparently they were protecting some plates at that time. I won't give you all the items, but on the—there are a few peculiar items. On September 21st there was labor charged on water tanks; apparently, one hour, and they started removing cement again. On October 4th a shell expansion plan was charged for.

Q. What is a shell expansion plan?

A. Well it isn't a true expansion; it is expansion in one direction only. They take the profile of a ship, the plan, and then expand as far as the breadth and depth are concerned, and give you a series of lines running fore and aft, showing the seams of the plates, and the butts.

Q. What is it used for?

A. The purpose is for—generally they know the sizes of plates required for each part of the boat, which the shall expansion covers.

Q. Is that usually prepared before repair operations are undertaken?

A. It is nearly always repaired for a building operation; and in a heavy repair operation it is generally supplied or prepared; it is a very useful plan for a foreman to have.

Mr. Underwood:

What date was that Mr. Thompson?

A. I have it October the 4th Mr. Underwood.

Mr. Underwood:

Thank you.

A. Then—

(By Mr. Matteson):

Q. What does the supplying of the plan of that date, indicate?

A. It indicated to me that some additional work was to be done; and that was confirmed by the fact that on October 12th to the 20th, 60 percent extra steel,—that is extra over and above what they had ordered in June, was charged. It looked as if they found additional work and had given another big job. The boilermakers finished on the bottom of this boat on the 26th of October, and with the exception of those guard angles I have mentioned, that is the first mention in the accounts of any work being done on the sides. The work was finished on the bottom on the 26th of October and the sides were commenced. On the 28th she was undocked. I think the rest will probably burden the record.

Q. Did you find in your analysis of these bills any items that could be attributed to removal of the gasoline tanks on the vessel?

A. No, sir.

Q. Did you find any items that could be attributed to removal of floor frames or plates in the vessel?

A. That is a double question, Mr. Matteson. I would like them separated, if you don't mind. I saw no trace in the bills of any work on floor plates.

Q. Just tell us what, in your technical language, you mean by floor plates?

A. Running across; the bilges come around here and around there; you have a plate running right across, a straight plate. Those are known as floor plates.

Q. Is that standing on each side, standing at right angles to the bottom of the boat?

A. At the bottom of that is the frame angle, on the top, generally on the other side, but it may be on both sides, double, what we call reverse frames. I saw no record in the accounts of any work having been done in connection with the floors, or their removal. But there are items in the bills in regard to angles, angles were charged up; and it is possible, if not probable, that certain parts of the frames were renewed,—the frame angles.

Q. If none of the floor plates, as you call them, were removed from the vessel, wouldn't it have been possible to take the gasoline tanks out through the bottom of the vessel?

A. No, sir.

Q. Do the bills show what was done with the side plating of the vessel?

A. Well I wouldn't say that the bills would show that. The bills indicate that there was a considerable amount of boilermakers' work on the sides of the boat; the bills do not indicate the exact nature of that work. With the exception that they would indicate that a considerable num-

ber of patch bolts were used after the side plating was dealt with.

Q. What are patch bolts?

A. We call them on the boat,—they are screw bolts, extending,—for the purpose of attaching a patch to another plate, or a plate to a plate, instead of riveting or welding,

Q. Mr. Thompson you were present I believe with counsel and the Court at the examination that was made of the vessel in October. Did you at that time observe the side plating of the vessel? Did you at that time observe it?

A. Yes I did.

Q. And what did you observe with respect to it?

A. I found that the sheer strake had been doubled on both sides and attached to the original sheer strake by patch bolts.

The Court:

What is that term? Sheer what?

A. Sheer strake, is one member of one of the principal girders of a ship. It comes adjacent and near to, and will extend above the main deck of a ship. You have the side plating of a ship, where your deck comes like that, your Honor. That first strake from the main; because you may have several upper deck sheer strakes; this is the main deck sheer strake. It is attached to the deck plating or the deck stringer plating by means of a gun'le angle, and that is known as the sheer strake. It comes from the old term, sheer plank in a boat; the top plank, you put the sheer in.

Q. As applied to the Seminole Mr. Thompson what was the sheer strake or plating on the Seminole?

A. It was the sheer strake of the main deck of that ship.

Q. Was it the topmost row of plating along the side of the ship?

A. Oh yes.

Q. Now—

A. It is rather unusual construction there,—a construction I am not so used to; but I am quite prepared to admit it was a sheer strake.

Q. Now if it was the fact that the side plating, the original side plating of the vessel was not removed, but doubler plates, or additional plates were fastened on the outside of it, would that work be accounted for by the items you have mentioned in the bills?

A. Yes, sir.

Q. If the side plating,—the sheer strake, had not been removed from the vessel, would it have been possible to have taken the gasoline tanks out through the side of the vessel?

A. In my opinion it would not be possible.

Q. Mr. Thompson did you find any items in the bills that could be attributable to removing the bulkhead, steel bulkhead, between the engineroom and the tank compartment?

A. I couldn't say; the bills would not—I couldn't answer that from the bills. Removal of the bulkhead would be boilermakers' labor. I don't know; as far as the bills are concerned, I can't say.

Q. If that bulkhead had been removed and replaced after—would it be possible for the plate to have been replaced in place, after the tanks were in place?

A. Yes, sir, with studs, but not with rivets or bolts.

Q. As you have observed the Seminole, in October, how was that bulkhead fastened in place at that time?

A. Riveted, with the exception of one loose plate.

Q. And where was that loose plate?

A. Well I think it was approximately in the center of the bulkhead, on the engineroom side of the tank space. I didn't actually measure the distance, but my recollection is that it was approximately the center.

Q. Did you notice the width of that plate with respect to the width of the tanks?

A. Not on the job; no, sir.

Q. Well can you—have you observed it in any way?

A. I have observed it in the photograph you put up to Mr. Gibbs yesterday.

Q. And that was, I think—

A. It did not occur to me to look at that for any purpose.

Q. I think that was Libelants' Exhibit 9?

A. Yes, sir; I was looking at the time Mr. Gibbs was pointing out,—that is when I observed it.

Q. Is there anything about the loose plate that you speak of there, that indicates its width with respect to the tanks?

A. Assuming this is a valve opening here, marked number three, and this is a valve opening there marked number two, the width of that plate would seem to be approximately the width of from center to center of the tank, whatever that space was.

Q. If that was the width of that plate, would it have been possible to remove or replace the tank in place through that opening, if the plate were removed?

A. Had the plates been in the right position, I think it would have been; but judging from this, I agree with Mr. Gibbs that the edges come in the center of adjoining tanks. I don't think the removal of the plate then would help—would be any good for the removal of the tanks. I thoroughly agree with what he said on that.

Q. Was there anything that you observed in these bills that could be attributed to raising the tanks to a higher level than they had been before the operation began?

A. Well, no; as you raise that question, I would like to add to another answer I gave. I was not taking into account the lack of labor, insofar as labor in the engine-room; I see now by this further question, about the removal of the bulkhead, is not indicated in the accounts, because there would have been certain labor by engineers, to remove the pipes attached to the tanks. So I would like

to add that,—or rather, alter my reply in that respect; it didn't occur to me at the time. You never asked me that question outside, and I was totally unprepared for it. I answered it as truthfully as I thought at the time. I think the accounts do show that that bulkhead was not removed, because of the lack of labor items for piping.

(Thereupon the hearing was adjourned to be resumed at 9:15 o'clock A. M. of the following day, to-wit; November 18, 1939.)

Saturday, November 18, 1939, 9:34 o'clock A. M.

(Hearing was resumed pursuant to adjournment of the previous day.)

Mr. Matteson:

In connection with the testimony of Mr. Gibbs, I ask to have the encyclopedia article marked; and we have had a typewritten copy made of the article, to be substituted for the book.

(The typewritten copy of encyclopedia article, so tendered, was admitted in evidence and filed as Libelants' Exhibit No. 147; this being the same exhibit previously numbered 138.)

4089 Thereupon: MR. JOHN A. THOMPSON resumed the stand and further testified as follows upon continued:

Direct Examination:

By Mr. Matteson:

Q. Mr. Thompson, yesterday we were discussing the bills for repairs to the Seminole in 1927. Was there any-

thing in the bills, as you analyzed them, that referred to the possible construction of pans to be placed under the engines of the Seminole?

A. Not in my opinion.

Q. I think I misspoke; I was referring to pans under the gasoline tanks.

A. I understand that was your question.

Q. Was there anything that you found in these bills that could refer to the removal of the main engines, in the engine room of the Seminole?

A. No, sir. You asked for these yesterday, Mr. Matteson; these are the photostatic copies that I used.

Q. That is in making your study, you used a photostatic set of copies of the original exhibits?

A. Yes, sir.

Q. Well just leave them on the table; I don't think they need to be marked.—Assuming that over the tank compartment of the Seminole were located the captain's quarters, and outside of the captain's quarters there was a wooden deck over the compartment, as indicated on this exhibit—Phipps' Exhibit A, plan of the Seminole,—did you find anything in the bills that could refer to removal of any part of the structure over the tank compartment for the purpose of removal of the tanks while the ship was on the ways?

A. Not while she was on the ways; no, sir.

Q. Well was there anything in the bills to indicate that any work on that part of the structure of the ship was done at any time?

A. I couldn't say as to afterwards; there was a lot of carpenter labor charged after it was launched; so I confine my answer to the question you actually put.

Q. The carpenters' labor that you found, that might possibly refer to such work, came after the vessel was launched?

A. It is possible, according to the bills.

Q. Did you find—

A. Mr. Matteson, you distinctly confined that question to carpenters' labor, do you not?

Q. Well I am making it in such form that you may tell us what class of labor would be required for that type of work.

A. Well that would be the mechanics' labor, removing certain things, in connection with the removal of tanks aft.

Q. I am referring now solely to the structure over the tanks?

A. No; it is possible after the launching of the boat.

Q. Now did you find anything in these bills that could refer to removal of the tanks from the Seminole, or work on the tanks, outside of the vessel, consisting of removing the bottoms of the tanks and re-riveting, and restoring them and replacing them in the vessel?

A. The gas tanks, you are referring to?

Q. The gas tanks, yes.

A. Well I will admit that certain classes of labor may possibly have been included in the bills; but I find a total absence of the right size of rivets for that job. There is no rivet charged less than one-half inch in diameter, and in my opinion the flange of the bottom furnaced piece,—that is the lower crown, as you call it, could not take a half inch rivet and make a satisfactory job.

Q. Why not?

A. Because the width of the lap is not sufficient, in my opinion, to take a half inch, in plus a 32nd hole; that is a hole $17/32$ in diameter.

Q. What was the width of the flange?

A. The seam?

Q. Of the seam, yes, sir?

A. Approximately an inch and a half maximum.

Q. Does that refer to the distance from the center line of the holes to the bottom of the tank?

A. No, that refers to the outside of the one plate to the inside of the other, to the extent to which they overlap.

that is the width of the lap. It is a simple thing. Take a piece of paper, that is the one plate, and that is another, — or part of the same plate rolled around. The width of the lap, as we call it, is from the outside here to the outside there; that is the width of the lap. It is quite a simple matter.

Q. Well if we can put it in words that will—

A. The extent to which one plate overlaps the other. I think that will cover it.

Q. You mean the extent to which one plate is in contact with the other?

A. Oh, if you like; but it overlaps the other. Because you may have a plate not overlapping, and they are still in contact with the parts; there is no overlap. It is true, the same thing; in a lap joint it is the extent to which they do touch one another.

Q. How far were the centers of the rivet holes from the bottom of the plate?

A. The center line was not even, it varied.

Q. Approximately how far?

A. Approximately three-fourths of an inch. They didn't vary considerably.

Mr. Underwood:

What was the answer, Mr. Bryant?

(The last answer was read by the reporter.)

(By Mr. Matteson):

Q. Well does that measurement have anything to do with your opinion about the size of the rivets?

A. Yes, I am just stating an opinion. In my opinion, that overlap is not sufficient for a 17/32 hole. The general rule as to the width of a lap, is the—

Mr. Underwood:

I object to that as not responsive.

Q. Is there any rule, Mr. Thompson, as to the margin required when riveting is done in a plate?

A. In good shipbuilding practice there is; and I think that the classification rules will actually give it. But the good practice, apart from any rule is, the diameter of the rivet, three times, plus an eighth. That is if you have a half inch rivet, your lap would be three half inches, that is an inch and a half, plus two eighth; in other words the plating on each side of the rivet hole has to be the diameter of the rivet plus an eighth of an inch. That is in my opinion and to my knowledge the customary good practice.

Q. The first question that I asked you was whether there was anything in the bills that could refer to the removal of the tanks and the work on them, in your opinion?

A. In my opinion there is no such reference.

Q. Now if the work which I have described had been done with respect to the tanks,—that is removing them from the vessel, taking out the bottoms, replacing the bottoms, and replacing the tanks in the vessel, while the vessel was on the ways, what charges would you expect to find in the bills, to indicate such work?

A. That is supposing if possible to remove the tanks with such labor as I found in the bills, the additional labor in connection with the removal of the tanks would first consist of mechanics removing the piping from the tanks, and the fittings; second, or the following charge, would be the provision of lifting beams.

Q. What do you mean by lifting beams?

A. Well the provision of a crane large enough, to come up along side, would be one; or the erection of shear-legs. The provision of lifting tackle, and skids at the sides of the boat, if you used shear-legs; if you have a crane large enough and of the right type and suitable, you could probably lift those tanks out without skids; you could lift them out, and by moving the jib of the crane around, deposit

the tanks on the ground or on a truck or other vehicle, for the removal of the tanks to any suitable place for the purpose of steaming the tanks out. That is assuming, I believe you mentioned, that the tanks had to be repaired.

Q. Yes.

A. There would be the cost of removing those tanks to that place; there would be the cost of steaming out; there would be the charge for what we call a gas-free certificate, from someone who was in a position to give such a certificate. There would be the cost of the repairs themselves, and bringing back to the ship, and lifting on. There would be quite a number of charges; and replacement of all the piping. It would be quite a considerable charge, all told.

Q. Did you find in the bills, any charges of that type?

A. My opinion, they are not present, sir; at least I couldn't discover them.

Q. Now from your examination of the bills can you tell us whether there is anything there that could refer to welding of the tanks at that time?

A. Yes, sir.

Q. That is—

A. There is a charge for welding rods; charges for welding rods; and there are charges for the supply of oxy-acetylene, which I presume was used. Apparently there was some welding done; the bills are not clear as to where the welding was done. I may say in that connection that in my opinion the charges for oxy-acetylene show definitely that most of those gases were used for the removal of the rivets; in other words, the oxy-acetylene plant was used for burning out rivets.

Q. Why do you say that?

A. I say that because of the difference in the proportions of the gases; difference in the proportions of the gases used; it was two and a half to three times, I think, speaking from memory, amount of oxygen delivered, to

the amount of acetylene delivered. In welding, different welders have different methods, but my experience has been with the average welder, that is a welder using oxy-acetylene plant, and not electric welding,—uses almost equal proportions of the oxygen and acetylene. But in cutting out, that is using a torch,—a cutting out torch, the process, to heat the part you are going to cut out, with acetylene, and then to blow the oxygen, a large quantity of oxygen, through. The oxygen does the cutting. You have the two tubes brought up, and you warm the plate up and then blow a very hot gas through, and you cut the plate right through, or cut the rivets through. In my opinion, that form of cutting is never used in repairs where the part that it has been applied to, is replaced. And I have never known yet of a rivet cut out from a plate, and the plate afterwards used, where that plate was called upon to do any duty in a watertight or a gas tight joint. We only use, in my experience, acetylene for cutting out where we are going to discard the plate cut out.

Q. Why is that Mr. Thompson?

A. Because of the damage to the rivet hole; the material, not the hole itself; I mean the material surrounding the rivet hole. We do not think that you can make a satisfactory job,—that is a tight job, by using a plate, the rivet of which you have cut out by any cutting torch.

Q. Well now is there anything in this bill to indicate—

A. I am only stating through my opinion, and what has been my experience all through my life, both here and in England and in Australia; that practice to my knowledge has been universal,—that is, in my experience.

Q. Now, Mr. Thompson, is there anything in these bills to indicate whether or not any soldering was done on the job at this time?

A. As to labor I couldn't say; but I do not find a charge for any solder.

Q. No charge for solder in the bills?

A. That is all I could say.

Q. You I believe were present with the Court and counsel on board the Seminole when a visit was made there in October, were you not?

A. Yes, sir.

Q. And at that time did you observe the condition of the tank number four, which had been lifted out and placed on the forward part of the Seminole?

A. I observed its condition, exterior.

Q. Tell us what you observed?

A. In connection with that tank?

Q. Yes, at that time?

A. I observed that the seams and the bottom, that is another seam, had not been caulked. I observed the bulging in the bottom.

Mr. Underwood:

The what in the bottom?

A. Bulging in the bottom. That is not a correct term, Mr. Underwood, but it is referred to.

Mr. Underwood:

I just didn't hear you.

A. If I am not speaking loud enough, please tell me.— I observed that the rivets were of equal size throughout. I observed that there were absolutely no marks that would point to any of the rivets having been cut out; that is any previous rivets having been cut out. I observed—that is, I formed the opinion from my observations, that the tank had not been galvanized after manufacture; that in my opinion the tanks had been built of galvanized sheets.

Q. Did you find any evidence of any soldering on the tank?

A. Yes, I was going to say, I observed that the tank had been soldered in the vertical seams for a distance of—I don't know exactly, but I think about eighteen to twenty

inches from the base,—up from the base; and I formed the opinion that the bottom seam had at one time been soldered completely around. I observed that some of that soldering, quite a considerable proportion, at various places, had disappeared in places. I failed to observe any marks of soldering or any appearance of soldering had been present, about the position I stated where the soldering was.

Q. You are referring to the side seam?

A. The side seam. I think; apart from the general observations as to its appearance, I can't recall at the moment any other observations I made. Perhaps I ought to in fairness mention that I did not observe that the tank had been fitted with reducing pieces in the bottom outlets, mentioned by Mr. Munroe, but I wouldn't deny that they were there.

Q. What do you refer to as reducing pieces?

A. Well generally,—on that particular one?

Q. Yes.

A. Reducing pieces generally? That one?

Q. When you speak of reducing pieces—

A. I meant to speak of the reducing pieces given in evidence; am I allowed to? I didn't observe a reducing piece.

Q. You spoke of a reducing piece, I just want to know what you had in mind when you spoke.

A. The reducing piece generally is for the purpose of reducing,—of using a smaller pipe than was originally intended.

Q. You refer to a reducing piece—

A. In connection with the tanks, I mean. Reducing pieces are used in other connections where you don't need so large a flow from a main pipe; you have branches where you don't need so large a quantity, then you use reducing pieces to bring the large pipe down to the pipe you are going to use on that branch.

Q. Now you spoke of the fact that you—you referred to caulking: how are you able to determine that the tank had not been caulked?

A. The entire absence of any caulking tool marks, even of the lightest nature.

Q. And how does that indicate whether or not the tank had been caulked?

A. Caulking as applied to steel plates, will vary according to the distance that the plates are apart; and it is not good practice to caulk plates that are widely separated before the caulking. The plates should be brought together as tightly as possible before caulking. And then when you have got two plates together, overlapping, the edge you are dealing with, the outside edge,—the other edge being inside, the caulker goes along that seam with a tool; he goes along backwards and forwards, he does not go along caulking heavy, he has to go along gently, so that he will not distort the fibres of the plates unduly. Caulking does not add to the strength. It shows a line definitely there where a caulking tool, had the tanks been caulked, you would have seen definitely the line of the tool, and about half the thickness of the plate, that is the outside half of the plate would be higher than the inside. And furthermore there would have been an uneven edge on the inside; because the caulking is not done so evenly that you get a perfectly straight line; you get a line of the tool.

Q. Did you observe any such marks?

A. I did not, sir. I am perfectly satisfied from the experience I have had with caulking during the whole of my career, that those tanks had not been caulked on the outside. There is no question about that whatsoever.

Q. Now Mr. Thompson you spoke of no marks of cutting, with respect to the rivets; what is the significance of that?

A. I think, what I meant there, I believe that in my opinion, from my experience, had rivets been cut out by hand, by chisels, you invariably get marks on the plate

adjoining the hole, all around marks of the chisels. It is impossible to cut out a series of rivets like that without leaving marks of the tools.

Q. Were there any such marks on the tank?

A. I didn't find any.

Q. Now you spoke of the fact that the size of the rivets was uniform throughout the tanks; what is the significance of that?

A. Supposing it were possible to remove the rivets by cutting out, without leaving marks—I say it isn't, but suppose it had and that those rivets have been renewed for some other reason; good practice calls for the re-amer of the rivet hole of any tank that has had any service, because the material of the plate around the rivet hole invariably rusts, and requires to be removed before a rivet can be put in,—a new rivet. The new rivet then is of a larger size. In that case, those were three-eighths rivets; I think seven-sixteenth rivets would have been used. In other words, you would have seen the difference between the size of the rivets at the bottom of the tank, and the rivets that had been in the tank originally.

Q. Assuming Mr. Thompson that the rivets around the bottom seam, fastening the bottom to the tank, had not been removed with a cutting tool, but had been burned out, would there be any difference then?

A. Well I think I have already said that I have never used a plate from which the rivets were removed by torch; I wouldn't dream of using it. I think the marks, if one did use such a plate, the marks would be still more evident, you would get evidence of burning; and I couldn't understand anyone having any knowledge of plate work,—not tank work, only plate work, using such a plate for such a job. I do not consider that anyone would remove those rivets by burning.

Q. What is the effect on a metal, of burning out a rivet?

A. Well I think in burning out a rivet, burning out a series of rivets, you must inevitably flow the metal on the

side of the hole; just as readily as you burn out the rivet itself, you will flow the metal. You burn out the rivet by flowing the metal, and you would at the same time flow the metal around the hole. That is not an opinion, that is what I have experienced in the whole of my existence.

Q. Let's just assume Mr. Thompson that the rivets of the bottom seam had been removed by burning, and subsequently the plates restored and reriveted: in your opinion would there have been any difference in the size of the rivets, in that case?

A. No, the same opinion would apply there, in the replacement. That is the necessity for reamering out the hole, still, and putting a larger sized rivet.

Q. And why is that?

A. For the same reasons I have stated, if the rivets had been cut out by hand, with cross-cut chisels, that the edge of the hole rusts, and it is not good practice to put back the same size rivet as originally used.

Q. From your experience, Mr. Thompson, referring to the side seam, if the side seam had been soldered above the point where you observed the solder on the side seams, from eighteen to twenty inches from the bottom, and the solder had been caused to run off by hot fire; in your experience what would you have expected to find, if anything, in the appearance of the side of the tank?

A. Well you put the question in rather an inclusive way, Mr. Matteson. In my experience,—I want to be perfectly fair in this case: I think the only thing that I can express there is an opinion; I wouldn't base it on experience so much, I would limit this to an opinion based on general experience. I would expect to find—I don't want to go any stronger than this, I would expect to find discoloration, due to the acid used in the flux; and I would expect to find some traces of solder remaining. I think that is as far as I would care to go Mr. Matteson.

Q. Well assuming that the tank had been through a hot fire.

A. Assuming the tank had been through a fire of the order that apparently, from what I hear, the Seminole went through.

Q. Mr. Thompson there has been some description of a test that is said to have been held on this tank, and one part of this test was said to have consisted of closing off the outlets of the tank, after the tank had been completely filled with water; and that while the tank was in that condition a man of substantial weight stood on the top of the tank, and jumped on it and kicked downward with his heels as he landed on the top of the tank; and it is said that this created the effect of a hydraulic ram through the action of water in the tank, which caused distortion in the bottom of the tank. In your opinion what would be the effect of such a test, if held?

A. The effect of such a test on the top of the tank, that we have been discussing?

Q. Yes.

A. Well I don't think there would be any effect at all on the top, unless the top were very badly rusted, in the first place.

Q. Well when you say effect on the top, what do you mean?

A. I don't think the top would have moved; I don't think there would be any pressure exerted on the water in the tank at all; that is, pressure of the nature that is described in the manner you have.

Q. What would be necessary to produce pressure within the tank?

A. That top would have to go in, of course,—reduce the cubic capacity of the tank, and thereby put additional pressure on the water.

Q. Now assuming that the top of the tank did give as much as an eighth or a sixteenth of an inch, what would be the resulting forces that would be exerted in the tank?

A. Well I am speaking of course now as to just my opinion. In my opinion, if that did happen, the deflation,

as you call it, of the top, caused by that means, would I think be an effect over the whole area of the top, and in amount would be negligible; unless the top went in to a considerable extent. Because the water is acting on the top, helping to keep the top up. There would be additional pressure, but I have never made such a test, and I think that is as far as I would care to go on that.

Q. From the theoretical point of view, assuming that the top of the tank were depressed a given amount, is there any way of calculating the pressures that would be set up in the tank?

A. I think you would have to have several factors definitely established, and I think on that point I have gone as far as I would wish to go. Because I want to be quite fair in what I say, I don't want to embark on a journey the end of which I don't know, or what I would arrive at. I can't conceive of such a test being any good at all, unless the top was so badly corroded that—otherwise I think those tops are pressed, they are pressed tops; and the ends of the tank in my opinion are the strongest parts of those tanks.

Q. Well now it has been suggested Mr. Thompson that there is some sort of a hydraulic effect that could be produced by depressing the top of the tank in that fashion, which would be multiplied many times when it acted on the bottom of the tank, at the opposite end of the tank. Can you give us an opinion with respect to whether there is any such effect or not?

A. Well merely stating an opinion, not having given it much consideration, I don't think that would be. Pressure tests, or hydraulic tests, of that nature, that is using water—oh I think Mr. Matteson really I have gone as far on that as I care to go; because I want to be fair in this case; because I am only guessing if I go on.

Q. Mr. Thompson I think you referred to your observation of distortion on the bottom of the tank. Assuming that some test of some kind were applied to the tank, pro-

ducing that kind of distortion in the bottom of the tank, what would that indicate to you if anything with respect to the bottom of the tank?

A. Just answering the question that you have put, it would indicate to me that the bottom of that tank internally was heavily corroded.

Q. Why do you say that?

A. From the condition that you have named, the fact that it is permanently distorted. One must realize, Mr. Matteson, that in the water test of all vehicles, even heavily built Scotch boilers, we make tests under test of deformation of that tank or boiler,—particularly to boilers it applies; the boiler actually changes its shape under an ordinary test of double its working pressure. We measure the distances the various parts creep, and we find that there is a deformation of a boiler under cold water test. And doubtless that tank, in common with all other tanks, would, under cold water test, deform; it altered its shape. But here you are referring to a permanent deformation after the test is over. In the other test, the boiler returns of course to its normal shape and size but here you are speaking of a permanent deformation, and I am applying my opinion to the permanent deformation. That permanent deformation would indicate to me that there was heavy corrosion on the part that was deformed.

Q. Will you explain that,—why the permanent deformation indicates what you say?

A. Well the fact that it failed to return. The top, if it had been pressed down, returned to its normal state. The bottom apparently—I accept Mr. Munroe's evidence, that during this test, some part of this test, the bottom came down and remained down.

Q. Well which part of the tank, in your opinion would be stronger, if in its original condition, assuming they are of the same weight,—the sides or the bottom?

A. The bottom, in my opinion.

Q. Why is that?

A. Because of its shape.

Q. Because of the inverted crown?

A. I accept the term used already, so we won't get too many terms in this case; I accept the explanation given, that that bottom is in the nature of a bridge, it is curved in, every way: it is a pressed steel bottom, pressed in a press, in hot condition, under very great pressure; and the bottom—such bottoms are very very strong. If we don't have that form of bottom,—you have a flat bottom, good practice calls for the use of stiffening brackets along the sides to the bottom.

Q. Now what did you observe with respect to the structure of the Seminole; with respect to her stiffness,—the means of providing stiffness to the hull, and protecting the vessel against vibration or movement.

A. Well I think I have already stated that,—and I didn't do this from observation, I did this from the dimensions given me; I think my evidence was that she was of unusual depth to length proportions. But now I understand this question goes to what I observed. Is that the actual structure of the boat?

Q. That is right.

A. I fail to find any intercostal keelsons in the bottom of the boat.

Q. What is an intercostal keelson?

A. Intercostal keelsons are a form of continuous angles, and by continuous I don't mean they may be in one length, but were they not in one length, at the break where the angle finishes, another commences, you put what you call a bosom piece, to make good the break. But for practical purposes we will assume continuous angles, fore and aft angles, attached to the top of the vertical floors; that is, the vertical plates between the keelsons and the bottom of the ship. Those keelsons run fore and aft. Between those keelsons, and between the floors, a series of steel plates of a depth equal to the depth of the floor and the depth of the keelson. Those plates are attached to the

keel plate by angles, to the floor plates by angles, and are riveted between the double angles,—the continuous angles which I have called the keelson angles.

Q. Well what is the purpose of that keelson?

A. The purpose is to add to the strength of the boat, of course; and they actually form one of the principal girders of the ship, fore and aft.

Q. Do I understand that is a continuous girder through the bottom of the ship?

A. Continuous girder.

Q. Were there any such keelsons on the Seminole, so far as you could observe?

A. Not as far as I could observe, sir.

Q. What longitudinal strength members were there in the Seminole?

A. I understand she had a bar keel; I didn't observe it, because she was afloat. If she had a bar keel she would have the flanging of the keel plates, and on that point I ought to say that there is no—the keel plates, if they were flanged keel plates, to the keel bar, were not renewed; because there is no flanging or fire work included in the accounts. So I was rather surprised to hear in Court that she had a bar keel. I don't know. I assume from reading of the accounts that the keel plates were renewed.

Q. Well now outside of that—

A. You have the flanging of the guard strakes; the keel plates then or the garboard strakes; you get the vertical flange. That does add to the boat. And those are attached to the keel bar, and they then in smaller vessels, —not vessels of that size and type of bottom,—big flat bar; quite apart from, if she did have a bar keel, reasonably good construction would call for intercostal keelsons. And I think that any rule, if she had been classed,—she was not classed, but if she had been classed, would demand the inclusion of such keelsons.

Mr. Underwood:

I move to strike out the requirements for classification, from his answer.

Mr. Matteson:

I am perfectly willing to do that.

Q. I just want you to outline for us, Mr. Thompson, what longitudinal strength members this vessel had, and what your opinion is of her fore and aft stiffness, in view of the construction that you observed.

Mr. Underwood:

You will pardon me just a moment.

(Conference between counsel.)

(The last question was read by the reporter.)

A. Well Mr. Matteson you have put a question to me that would take a long time to answer; because transverse members, strangely enough, lend much less to overcoming longitudinal stresses. But if you want me to confine my answer to what were the longitudinal members, I will reply that way.

Q. Let me put it this way: what did you observe with respect to the strength members of the hull of the Seminole, and in view of what you observed, what was your opinion as to her longitudinal fitness?

A. In my opinion she was poorly provided with longitudinal girders. I think that is a short reply. The other main girder—longitudinal girders of the ship consist on each side of the sheer strake attached to the deck stringer. A girder consists of at least two members. The members—the sheer strake and the deck stringer, attached, form a girder. I think as far as the bottom of the ship is concerned, in my opinion,—I am just expressing an opinion,—she was poorly provided with such girders.

Q. Well now in view of that, what is your opinion as to the stiffness of her hull, as respects whether or not she would be subject to vibration and longitudinal stresses?

A. From my experience, I think she would be subject to undue vibration.

Q. What do you mean by the term, vibration?

A. Well, movement. I take into vibration there,—I mean movement, that she would be—I use that as an antonym of stiff; she would not be rigid.

Q. You used the term, vibration; and I just wanted to know what you included within the term, vibration?

A. I thought you referred then to the ship as a ship, and apart from any inside causes. If you want to include vibration that was set up by the engines, I observed that the engines were mounted on wood seatings. That was something entirely new to me; in the whole of my career I have never come across a steel ship with wood seatings.

Q. What is the difference? What is the effect?

A. Well you don't get anything like as strong a job from a wood seating, as you do from a steel seating. In fact, a good class wood vessel of any size is frequently fitted with steel seatings, for that very purpose. But I have never come across a steel vessel with wood seatings, before. I think the effect would be that there would be considerable vibration from the engines when they were in operation. Briefly I think that boat would have more vibration than the average boat of her type: that is my opinion.

Q. Now getting back to the tanks for a minute—

A. But I haven't answered fully, Mr. Matteson. I noted the absence of strong beams in that ship. The bulkheads were lacking beams,—steel beams: and apparently I formed the opinion, rightly or wrongly, that a strong beam had originally been there, running through the original coal bunker, and that had not been replaced when she was converted to a gasoline ship.

Q. When you refer to a cross member there, what evidence did you observe of there having been such a cross member?

A. I think the evidence I observed consisted of one thing: that is, an opening cut and stiffened by doubling plate, in the side plating of the tank compartment on the starboard side. I think the photograph will show the openings I referred to; the opening rather,—one opening.

Q. Are those openings—

A. Opening, Mr. Matteson.

Q. Yes; can you point out the opening in this Exhibit, Libelants' Exhibit 6, the photograph?

A. Yes, here it is; that is the opening, here, and about one inch from the right-hand side of the photograph; and that is the doubling plate on that opening to which I referred. Furthermore, the angle at the top, you will observe,—that is the attachment angle to the deck above, is cut on the side of the opening, to permit the insertion of a beam. That opening could serve no other purpose, in my opinion, but for a strong beam.

Q. Now here is a photograph—

A. That was the opening, your Honor, I was referring to.

Mr. Underwood:

The opening referred to by the witness has already been marked on photograph, "Opening for beam".

A. Yes.

Mr. Underwood:

You have to get the right light on that to see it, but it is there. Can you see it, Judge?

The Court:

Yes.

Mr. Underwood:

Some other witness has already marked that.

(By Mr. Matteson):

Q. I show you Exhibit 3-X, a photograph of the Seminole taken while the fire was in progress. Will you tell me whether or not such a beam appears in place at that time?

A. I cannot discover one there, sir.

Q. Well do you observe the tank space?

A. Yes, sir.

Q. And the tanks?

A. Yes I observe the top—yes, I think I can see the top of all four tanks there; yes.

Q. And is there any beam such as you believe was originally present, as indicated by this slot, in that photograph?

A. I cannot observe one, sir.

Q. Well what would be the effect on the structure of the vessel, of the removal of such a beam Mr. Thompson?

A. There would be a reduction in strength at a vital place.

Q. Why do you speak of it as a vital place?

A. Well here you have a large opening in the structure of the ship, amidships, the part where you get concentration of stress. I think the effect—to overcome that weakness which we frequently get in vessels, with hatch openings, we have to put strong beams across. I think the absence of a strong beam would tend to make the effect of any movement on a ship, more noticeable there, than if she had one. Furthermore, the bulkheads forward and aft of the tanks, were lacking, when I saw the boat here,—the wreck, that is, were lacking steel beams. In my opinion those beams could not have been,—steel beams could not have been removed by any fire, as they would be riveted by steel or iron rivets, to the plates.

Q. And what would be the effect if the wooden beams were used there, instead of steel?

A. I am expressing an opinion when I say they do not take the place, by any means, of a steel beam.

Q. Why not?

A. In the first place the attachment to the bulkhead is nothing like so secure; and furthermore the strength of a wood beam across there, unless it were of very great size, would be nothing like—be the equal of a steel beam. That is an opinion, again.

Q. What would be the effect of that type of construction on whether or not the vessel would be subject to vibration?

A. I think it would further increase the effect of the normal stresses of that boat; cause internally or externally the further effect of weakening the vessel at that point, and cause her to—what has been described as weave, in the bulkheads; movements on piping. That is my opinion.

Q. Now getting back to the tanks for a minute Mr. Thompson; I want to describe a further test that is said to have been made on the tank that was removed from the vessel. It is said that the tank was removed, placed in an upright position, on wooden stringers, and that the bottom outlet was blanked off, the filling pipe outlet was blanked off, and the riser, seven or eight feet high, was installed on the outlet hole in the center of the top of the tank; the tank filled with water to the top of the riser, and the tank allowed to remain in that position for approximately twenty minutes. What, in your opinion, would such a test show, with respect to the tightness of the tank for gasoline?

A. What it would show? I don't know what it would show, Mr. Matteson.

Q. Would it show anything?

A. Do you mean, do I consider that hydrostatic test?

Q. Yes.

A. I certainly do not.

Q. Why not?

A. Well you haven't given me as one of the factors, the first essential in a hydrostatic test.

Q. What is that?

A. The complete cleaning and scaling,—or rather, scaling and cleaning of all about it; you only clean after you scale,—of the tank inside, before you attempt to make a hydrostatic test.

Q. Why do you say that is a requirement?

A. It is the requirement of good practice. I doubt very much whether you will see it in the rules, because in my opinion that is considered good practice universally.

Q. What is the reason for it?

A. That is only a twenty minute test.

Q. You have spoken of the requirement of cleaning of a tank before test begins; I want to know what the reason for that is.

A. Well you may, in putting light pressures like that on a tank, force pieces—substances, such as flakes of rust, or dirt, or other things,—I don't want to enumerate them; but anything that may be in a tank, you may force that into crevices in your seams, which may give you a false idea as to the tightness of the tank. The preparation of a tank, is as I say, the thorough scaling and cleaning it; wire brushing and cleaning it, particularly the seams,—the part of the seam you can get at inside; to see there are no loose pieces of rust that can be wedged into the seam, and by so doing, prevent what we consider a satisfactory test of that seam. So I say again, it is the first essential, prior to the hydrostatic testing of a tank, to see that the tank is thoroughly cleaned out of all substances that may interfere with the satisfactory performance of such a test. Then, you mentioned a time limit of twenty minutes; I haven't answered anything about that Mr. Matteson.

Q. I was just about to ask you about that; what does that have to do with it?

A. Personally, in my experience, the matter of twenty minutes—the time of twenty minutes would not be considered a satisfactory hydrostatic test.

Q. Why not?

A. Because the practice in shipyards is to leave them at least eight hours under that test.

Q. When the test is conducted by means of a riser, how can it be determined whether the test is satisfactory or not?

A. Well going back to an earlier answer, perhaps I ought to make that clear. There are certain tricks in hydrostatic testing, that we shipbuilders and repairers have to look out for. We find workmen who have been responsible for building or repairing a tank, knowing that this test will follow, to cover up poor workmanship; they sometimes—they do one of three things. We have found that they sometimes put in very fine oatmeal into a tank.

Q. What is the effect of that?

A. To flow into, as the water is going into the tank,—to flow into the seams, and by swelling, make the seams temporarily tight from inside. They sometimes use very fine sawdust. The commonest trick used, which we have to watch against, is to see that they don't use urine on the joints, a day or two before.

Mr. Botts:

Use what?

A. Urine.

(By Mr. Matteson):

Q. What is the effect of that?

A. They go up the seams in the rivets, they wash it over, in order to accentuate the rusting, so the seams shall become rusted and therefore temporarily make a tight joint. Those are tricks we have to watch. So therefore I say that in conformation with necessity, to see that a

tank is thoroughly free of any foreign substance, or any tricks of that type.

Q. Well now when the riser test is used, how do you determine whether the test is satisfactory?

A. Supposing all the other conditions are correct, a riser test of itself is very simple; it is just merely the ability of the water to remain at the same height all the time. If during a test we find that the water is lower in the riser pipe, we know of course then there is seepage or leakage at some point. The tank is then—the test is then stopped, the test is not considered a test any longer. We then have to find where that seepage or leakage occurs. We have to make good those seepages or leakages, and then start the test all over again.

Q. Now assuming that in the progress of this particular test, there were actually two small leaks observed, that caused the water to drop in the riser; would the observation of the water level in the riser, under those circumstances, be of any value in indicating the tightness of the tank?

A. Obviously no; no value.

Q. Now I want to describe another test said to have been made. Two of the three openings in the tank were banked off, and a hose connection fitted to another connection, and the tank filled with water, city water pressure applied to the tank under those conditions; again without any preparation of the tank by cleaning or otherwise; before the test was applied. Would that in your opinion be a satisfactory test for tightness for gasoline?

A. For how long was that pressure applied there? You are stating entirely different condition now.

Q. I don't think it appears just how long, but it was, say twenty minutes—the same period as the other.

A. You mean, without the tanks being cleaned out first?

Q. Yes.

A. No I wouldn't consider that satisfactory. You didn't state the amount of the pressure.

Q. Well it is said to be the pressure in the mains is forty to forty-five pounds.

A. Granting that pressure?

Q. Yes.

A. No, sir, I do not think, unless with the cleaning of the tank, I would not consider that a satisfactory test. It may be a satisfactory test, and more than satisfactory in a way, as to the strength of the tank. My observation of the tank has been as to the tightness of the tank, not as to the strength of the tank. At no time have I challenged the strength of the tanks of the Seminole in the original condition at least. My remarks have been applied to tightness.

Q. Now the suggestion has been made here that because of the thickness of the plates used on these tanks, gasoline tanks, on the Seminole, and their general construction, that such tanks would be good for a hundred years, or at least for a period far beyond the life of the vessel. What is your opinion with respect to that?

A. Well I just say I don't think so.

Q. Why not?

A. Of course you haven't stated what those tanks are made of; they may be made of ordinary tank steel, or ordinary mild steel.

Q. I am talking about these tanks on the Seminole, as you observed their construction.

A. From what I observed of the plating, in my opinion they were made of what I call Siemens-Martin open-hearth steel; I think that will be a near enough description. It is commonly used in shipbuilding, and to the best of my knowledge, in tank making; or, steels anywhere near that order,—any modern steel I know of. In my opinion, the lifetime of the tank of course depends entirely upon the care the tanks had in the first place. You can't lay down a law and say that tank is going to last

so long because of certain thickness; the primary condition comes in, What care has been given to the tank,—to the parts; to stop corrosion. Now you want me to give a reply as to the tanks on the Seminole, or to other typical tanks?

Q. Yes, on the Seminole; and I will supply the additional factor that these tanks were installed in the compartment, as you observed them, where they could not be worked on during the period they were on the vessel.

A. In my opinion the tanks of the Seminole are not fitted with means of access; that it is impossible to get inside the tanks and see them or to do anything to them. I don't think they had,—after a fairly careful observation of the tanks, any manholes. Therefore it was impossible to get into the tanks to do any cleaning, or to put anything on after cleaning. By cleaning I mean scaling and thorough wire brushing, which is normally considered the cleaning of a tank. I don't think—it would be impossible to apply protective coating to the plates; therefore I consider that those tanks, are of an order that would be subject to heavy corrosion,—continuous corrosion. And I certainly am of the opinion that they would not last anything like a hundred years; in fact I don't think you would find anything but rust after about thirty or forty years,—nothing but rust, in tanks of that order. I am quite certain that with tanks of that description, a lifetime of a hundred years is totally opposed to the whole of my experience; that is all I can say Mr. Matteson.

Q. Well taking these tanks as you observed their construction and installation, in your opinion how long do you think they could be depended upon in that situation, for tightness with respect to carrying gasoline?

A. Oh that is entirely a different question. I was referring to tanks as tanks, and leaving out entirely the matter of tightness. Now if you come to the matter of tightness, tanks of that type, with the impossibility of getting inside to examine the heads of the rivets, to see if there

are any cracked rivets,—because you cannot test a rivet from the outside, I want to make that quite clear; to be able to test a rivet, you have got to be able to get to the head. You couldn't examine the heads of those rivets to see if there were cracked rivets. Cracked rivets are not at all unusual. In my opinion, tanks of that type, you couldn't get inside to thoroughly scale and clean and protect, would not remain tight, to my satisfaction; I wouldn't pass them for being tight, test or no test, for a period longer—I will give you the absolute maximum, because I want to be absolutely fair; well to me they would be of no use after ten years; I wouldn't have them in a gasoline ship.

Mr. Anderson:

How long?

A. I give you ten years; but I realize I have given an earlier period in my previous testimony. I wish to be absolutely fair; I think there is plenty of scope here, I don't want to strain my evidence; I want to give as long a period as possible. I don't think those tanks under any conceivable condition could be what I call satisfactorily gas-tight for more than ten years.

(A brief informal recess was had.)

Q. Another point with respect to your observation of the tank in October, Mr. Thompson; what did you observe with respect to any soldering around the rivets of the bottom of the tanks, or on the sides?

A. Well frankly I didn't observe any. There might have been pieces of solder, I couldn't say; I didn't observe any, myself.

Q. You spoke of your opinion that the tanks had been made of galvanized plates and not soldered after being put together. Will you tell us how you came to that conclusion?—Not galvanized?

A. Well I am expressing an opinion based on experience, with galvanizing of plates on vessels; in the whole of my experience, hot-dip galvanizing; the metal or the vehicle that is to be galvanized is first pickled in an acid bath, to remove what is known as mill-bloom; that is the hard surface that is caused during the rolling of the plate. It is essential that that should be removed. And the pickling removes all dirt, and to give you a clean plate. It is thereafter cleaned from acid and dipped in a molten bath of zinc. I have never been present at a galvanizing job; I am speaking now not of the galvanizing process, so much as what you asked me. After it has been dipped in the zinc, it is pulled out, allowed to drain so that the surplus zinc can flow back into the bath. That zinc on the outside of the tank cools off, and as it drains it leaves on the rivets or the edges of plates, an extra thick coat, you would call it, or a bulb, described by sketch, showing where the drainage has occurred. So if that tank had been galvanized after it was made, I would have expected to find down the edges of the seams of the plates, and also on the rivets, such accumulation of zinc. And I noticed the rivets were round at their base, and also there was no accumulation or ridge on the edge of the tanks—that is the edge of the plates on the tanks. From those causes, or lack of evidence of such accumulation, I considered that the tanks had been built of galvanized sheets, and not dipped after manufacturing. Furthermore, had they been galvanized after manufacturing, I would certainly expect to see an accumulation of galvanizing, particularly on the—as you show in the photograph, the top seam of the tank; this photograph will do. I think it was apparent at the inspection, to anyone who looked at the tanks, that there was no accumulation of galvanizing on that ridge, which was quite a distinct ridge. From the causes stated I am satisfied in my own mind that those tanks were not galvanized after manufacture.

Q. And what would be the effect on the tightness of the tank, with respect to gasoline, as to whether it was soldered before—whether it was galvanized before being put together, or galvanized after the tank had been manufactured?

A. Provided the galvanizing—that is the zinc on the tank after it had been dipped, ran into the seams and completely filled up the crevices, and completely adhered to both surfaces, and remained so, the effect of course would be to make the tank more tight. I admit that.

Q. Now in the testimony that you originally gave with respect to these tanks, on the Libelants' Direct case, I think that you proceeded on the assumption that the tanks had been caulked. Does the fact that you now say that in your opinion the tanks were not caulked, have any effect on your ~~previous~~ testimony?

A. Oh, yes.

Q. Will you explain that to us?

A. Well I haven't had a long examination of those tanks at the time I gave my testimony first, and I credited the tanks with being caulked; frankly, because I didn't conceive that it was possible for anyone to use tanks of that type without caulking them. That is I think the reason why I stated I thought they were caulked.

Q. It has been suggested here that caulking a tank of this type is used only to correct leakage when it has been observed. What can you tell us with respect to that?

A. If the tank—is that the condition you put up to me now, do I understand that after it had been observed a tank leaks during use or test, it has been observed that the tank leaks through a rivet or through a seam, or both, that is the time then you should caulk the rivets in the seams? Do you mean the whole of the seams, the whole of the rivets, or just where the leak is observed?

Q. Mr. Thompson, I think my question is put to you clearly; will you read it again, please?

(The preceding question was read by the reporter.)

A. Oh, I am sorry; I realize now I didn't answer your question as you put it to me, Mr. Matteson.—That is contrary to my experience.

Q. Well what is your experience with respect to what caulking is used for, to tighten a tank of this type?

A. It is used in the manufacture—at the time the tank is manufactured, of course. I wouldn't consider caulking a seam after the tank had shown a weakness in its tightness,—to caulk it just merely where the weakness is shown on the outside; I wouldn't consider that a satisfactory repair, in the first place, because it does not follow, because you have got a leak localized on one part of the seam, outside, that that is—that the leak comes immediately at the horizontal or vertical line opposite that leak. We frequently find that a leak starts on the inside, at a higher spot, and works down the seam and comes out at perhaps another spot. So I would not consider just local caulking in the vicinity of the observed leak, as a satisfactory repair, in any case. Even supposing the tank was of such an order that she did not need at the outset, a caulked seam.

Q. Mr. Thompson it has been suggested that the closeness with which the rivets were spaced on this tank, obviated the necessity of caulking the tank. What is your opinion with respect to that?

A. If the tanks were used for water, I thoroughly agree. But for the use of storage of gasoline, I thoroughly disagree.

Q. Why?

A. Because I think that the caulking, or caulking and welding, are essential on gasoline tanks of the type we are discussing.

Q. It has been suggested that tanks used for this purpose, storing gasoline, are not ordinarily caulked or welded in their manufacture. Can you tell us as to that?

A. Speaking from my own experience, the custom is directly opposite to that. I have never known steel tanks for the carriage of gasoline,—of tanks of this order and type,—that is tanks of at least three-sixteenths thick, that were not caulked, or caulked and welded; or the seams welded, and the rivets. In fact if you wish me, I have an authority here that I consider a good authority.

Q. What do you refer to?

A. Well I am not referring to a textbook; I am referring to a well-known tank maker's catalog,—handbook.

Mr. Underwood:

I object to any reference to such a pamphlet, and move to strike it out.

Mr. Matteson:

I think the witness is entitled to refer to authorities to support his opinion, if your Honor please.

Mr. Underwood:

I can't cross examine the man who wrote the book. Of course he can't refer to authorities; that is just as well settled as any proposition of law that I know.

The Court:

I think he can just refer to the authority on which he bases his opinion; but to offer that directly as his authority, I think is not correct.

Mr. Matteson:

I was not even offering the book, if your Honor please. He stated his opinion based on his own experience and his own knowledge, and said that that was supported by authority. Now he has mentioned in his answer the authority that he relies on, that supports his view. I think it is perfectly proper for him to refer to it in that way.

The Court:

Well he produces it here and in such a manner that it seems like he is offering that directly. He can refer to that; it isn't a textbook, as he says, but it is a catalog of some manufacturer,—that he has taken that into consideration. I think that that is as far as he can go.

Mr. Underwood:

Well I object to that; I don't think he is entitled to do that on direct examination.

A. Am I permitted to speak now, sir?

The Court:

No, I am still considering the matter. Why is it you refer to that?

A. Only merely as confirmation of a practice here, sir. I didn't base any opinion on that book at all, sir. I understood the question and answer I gave, of course as to my own experience.

The Court:

Why did you refer to the book?

A. I understood that in the course of my answer I mentioned that I had authorities to support it, my experience. In no other way do I wish to use the book; I don't wish to say that I base my opinion on it in any way. My opinion was definite many many years before I saw that book. That book has only come to me within the last two to three weeks, sir. It was in the course of searching for confirmation of opinions, which I thought I might be called upon to express, I spent about four days going through technical libraries, not only to find support, but to see if there were anything against it; as I disclosed to Mr. Matteson, it was only on that account. I didn't base my answer on that book in any way. I in-

tended my answer, in other words, your Honor, to refer to my experience only; I merely mentioned that as confirmation; in no other respect, sir.

The Court:

Well the way it presents itself is this; he has now said definitely that that is his opinion. Now on direct examination if he is asked, is your opinion supported by any authority, then if he answers that question and gives the authority, that is subject to the objection that the authority is not subject to cross examination. Now where it is brought in on cross examination, I think a different rule applies.

Mr. Matteson:

If your Honor please, I am quite satisfied to leave it that he has stated that his opinion is supported by authority; and if Mr. Underwood wants to examine him as to the authorities he can, or not, just as he choses.

The Court:

No, I am inclined to believe that Mr. Underwood is right about that, Mr. Matteson. If he goes beyond saying that is his opinion, and he bases his experience, and he has read, and so forth; but here he says, I have entertained and have this definite opinion, that is supported by authority: on direct examination I don't think he is entitled to do that. I sustain the motion to strike, with reference to the authority.

Mr. Matteson:

I would like it have it appear, if your Honor please, that Mr. Thompson handed his book to Mr. Underwood for examination.

The Court:

All right, sir.

Mr. Underwood:

Shall we describe the book? Handbook, Lancaster Tanks, apparently published by the Lancaster Iron Works, Incorporated, of Lancaster, Pennsylvania, copyrighted in 1930?

Mr. Botts:

Are you through with it? Do you want it?

(By the Witness):

A. No.

Mr. Underwood:

I would like to have it back on Monday.

(By Mr. Matteson):

Q. Mr. Thompson, it has been suggested here that condensation in tanks used for storage of gasoline, such as those in the Seminole, installed in upright position, with the convex bottom,—concave bottom, rather,—that condensation running to the bottom of the tank and filling the V-shaped formation at the bottom, would form a protecting seal which would protect the tank against corrosion. Have you an opinion with respect to that?

A. Well I speak from experience, and not as a chemist; I haven't attempted to qualify as a chemist, because I am not a chemist. From my experience, I don't think so.

Q. Going back to that answer; can you give us reasons for your opinion?

A. Well to be quite frank, Mr. Matteson, I haven't considered it much, apart from my experience, and I would like to answer from that point of view. I do know that there is present in steel plate a percentage of sulphur; and I judge from a long experience with rusted plates that the sulphur is not equally mixed throughout the steel; because steel plates do not corrode evenly all over. It would be a very much simpler job for the upkeep of a ship, if they did,—or the upkeep of a tank. But we find

plates much more badly corroded in certain parts than they are in others; and that is quite apart from any kind of electrolysis. I believe that that is due to the fact that there is more sulphur in one part of the plate than in another; that the heavier corrosion takes place at those places. I am not, again, speaking as a chemist, because I am not; I am just speaking from my experience.

Q. From your practical experience, is it your experience that a layer of water in the bottom of a gasoline or oil tank will protect the tank from corrosion?

A. I don't think so Mr. Matteson. In my own mind I am quite certain it wouldn't.

Q. Have you seen occasions when in fact it did or did not have that result?

A. Oh, yes, many occasions.

Q. And what result have you observed?

A. Well the results have been, in fuel tanks, on tanker vessels, where I have found the heaviest corrosion on the boundary bars,—those boundary bars are the bars at the bottoms of the tanks.

Q. It has been suggested here Mr. Thompson that a covering of rust on a steel plate is a protection to a plate against further rust. What is your experience with respect to that?

A. Entirely opposite.

Q. It has been suggested that these tanks apparently, from their construction, were originally constructed for some service more severe than that of storage of gasoline: for instance, tanks in which air pressure might be involved. In your opinion, would these tanks be suitable for any such purpose?

A. Air pressure—you didn't state the pressure, Mr. Matteson.

Q. I didn't state the pressure?

A. No. There may be more severe purposes for which a tank of that type could be installed, but I am unaware

of them, myself. I am speaking now from the matter of tightness, not the matter of stress on the plates or rivets: tightness of joints. Personally I haven't had any experience of a more strenuous duty than gasoline, but I don't deny there may be some that I have never heard of.

Q. Did you make a calculation as to the capacity of the bottoms of these tanks, up to the bottom of the outlet of the three-eighths pipe that was attached to the tank?

A. I think I made some simple calculations; I used a coefficient. I can give you the calculations I have got, if I can find them. Could you put that question to me on Monday morning, to save a little time? I will look it up then.

Q. Yes.

A. I know I have the calculations somewhere; oh, yes, I have it here, if you wish the answer now. It is merely a rough calculation.

Q. Just describe the steps by which you reached that calculation.

A. Well I think it was agreed with Mr. Munroe that the distance from—on the boat, I mean; I am referring to, on the boat.

Q. Don't refer to any agreement, just tell us your calculation.

A. I found on the boat that the center, from the bottom of the tank to the center of the hole, was four and three-quarter inches. I have assumed an eighth of an inch from the bottom of the outside of the tank, to the bottom of the seam of the crown, the lower crown; an eighth of an inch space. I have assumed—

Mr. Underwood:

I am not quite clear; will you read that please, Mr. Bryant? I have assumed what?

(The answer was read by the reporter.)

A. I have allowed a lap of one and a half inches, and I have allowed the thickness of the bottom, of three-sixteenths. And I have allowed a curvature in the tank bottom of two and a quarter inches; I did not measure that, I took that from Mr. Munroe's evidence. Those figures, later figures, commencing from the eighths of an inch, to the last figure of two and a quarter, I have given, total four and eight-sixteenths. From the four and three quarters, that is the distance from the bottom of the tank to the center of the outlet, I have deducted three-sixteenths, as the internal bore of the pipe—half the internal bore of the pipe.

Mr. Underwood:

That was how much, three-sixteenths?

A. Three-sixteenths, Mr. Underwood. That simple calculation gives me a distance from the top of the inverted bottom of the tank, to the lower point of the outlet orifice, of half an inch. I first briefly calculated the capacity up to the top of the crown inside the tank; that gives me, at a coefficient of .4, 5.4 gallons.

Mr. Underwood:

I am not sure that I understood that coefficient. Will you please read that?

A. That is a block coefficient; if you will block,—it may be a little high.

Mr. Underwood:

What is the figure?

A. Well one, if you take it as a complete space, it would be one; that is .4 of the space.

Mr. Underwood:

All I would like to have, your Honor, is to repeat the figure that he gave before; I didn't get it.

A. I am sorry; what figure are you wanting, Mr. Underwood?

Mr. Underwood:

The coefficient you need.

A. 4. I will concede that that may be high or it may be low; that is the coefficient I have taken, upon which this calculation is based. That would give me there the capacity to the top of the crown, inside, of 5.4 gallons. The capacity from that point to the bottom of the outlet orifice is taken as three gallons; a tank of this capacity is approximately six gallons per inch of depth; and there being a half inch depth, there would be three-gallons. The total I estimate, capacity below the bottom of the outlet orifice, I make to be 8.4 gallons per tank, or a total for the four tanks of 33.6 gallons. Is that what you were asking, Mr. Matteson?

Q. Yes. Now assuming that there was a gauge connection attached to the outlet line:

(Temporary interruption.)

Q. Assuming that there was a gauge attached to the outlet line in such manner that the bottom of the gauge was three inches above the outlet, what would be the capacity of one of these tanks up to the point at which gasoline would be visible in the gauge?

A. Is that the dimension you have given me, three inches to the top of the outlet orifice, or to the bottom?

Q. Well, calculated both ways.

A. Well at six gallons per inch of depth in a tank, if that calculation is taken to the top of the orifice, you have a space of three and three-eighths; that is approximately three and three-eighths, six gallons per inch, reducing to a decimal place, I will say roughly about twenty gallons. If that three inches is given me as from the bot-

tom of the outlet orifice, the capacity from that orifice to the position where the glass is showing, would be eighteen gallons per tank.

Mr. Underwood:

What was the first figure, Mr. Bryant?—How many gallons?

The Reporter:

Twenty gallons.

(By Mr. Matteson):

Q. Does the figure that you have just given us include the 5.4 gallons that you figured?

A. Oh, no; I understood, the additional quantity. I am sorry.

Q. I just wanted to be sure about it.

A. Yes, we would have to add 8.4 per tank; 8.4 gallons per tank. I am sorry Mr. Matteson, I thought you meant the additional quantity.

Q. That is all right, as long as we have it clear. Just so we will be sure we have it clear: if you measure the distance that I have spoken of, from the bottom of the orifice outlet, what is the figure that you add?

A. Approximately twenty, I figured.

Q. Approximately twenty?

A. That is six gallons per inch, approximately twenty; additional, that is.

Q. And if you measure from the top of the orifice how much would it be?

A. Additional, eighteen per tank.

Q. Then adding the eighteen to the 8.4, below that point, it would be 26.4 gallons per tank, would it not?

A. Per tank, yes.

Q. And for four tanks—

A. 25.6—105.6.

Q. One hundred five and six tenths gallons?

A. One hundred five and six tenths gallons.

Q. And if the measurement is from the bottom of the orifice, it would be approximately eight gallons more than that, is that right?

A. Yes, two gallons per tank; about eight gallons more.

Q. Assuming the draft of the Seminole amidships was four feet, can you tell us whether or not the bottom of the trays installed under the tanks was or was not below the water level outside the hull?

A. It would be below.

Q. How much below, can you tell me?

A. I have a rough sketch; the bottom of the trays—

Q. Yes.

A. That is ignoring the thickness of the tanks; just the tray itself.

Q. Yes.

A. I make it nine and a quarter,—that is the top of the tray would be nine and a quarter inches below the four feet water line you have stated.

Q. The top of the interior bottom of the tray?

A. Yes, ignoring its thickness.

Q. From your observation of the Seminole was or was not the bottom of the inside of the trays below sea level when the vessel was afloat?

(The question was read to the witness.)

A. When she was afloat; well, I think that is a very different question there.

Q. Can you answer it?

A. You have given me an assumption first of four feet draft. I personally don't know what the draft of the vessel was.

Q. Well, I will withdraw the question. Mr. Thompson you have expressed the view I think in your previous

testimony that it was improper to have draw-off valves for gasoline in the engineroom of a vessel such as the Seminole. I want to ask you, assuming that it were necessary to have a supply of gasoline available in the engineroom for the purpose of priming the motors, whether that would in any way affect your view?

A. In no way whatsoever.

Q. If it were necessary to have gasoline available for the priming of motors in the engineroom of the Seminole, in what way, in your opinion, could it be provided, without an undue hazard?

A. Well by the fitting of a storage tank in an approved spot on the deck of the boat.

Q. If it were the custom to supply other vessels, that is fishing vessels accompanying the Seminole, with gasoline for fuel, from the tanks—or from the Seminole, would that in any way alter your view with respect to the propriety of having a draw-off valve in the engineroom?

A. No, sir.

Q. If it were desired to supply gasoline from the Seminole for such a purpose, what in your opinion would be a proper method for arranging for that supply?

A. By deck storage, such as I described before.

Q. Did you observe the main engines of the Seminole, as to their type, and are you familiar with that type?

A. Oh, yes, I have seen similar engines frequently,—what the engine appeared to me, to be similar. I have seen engines of that day, built by Winton, which I think were of similar type. They may not have been of the identical model, I can't say; but they appeared to me to be similar to many other Winton engines I have come across in the course of my service here.

Q. From your experience, are you able to form an opinion as to whether it would be necessary to prime engines of that type when they were hot?

A. I don't think it would be necessary, and I have never heard of it before.

Q. Can you give us an opinion as to the amount of gasoline that could be used for priming the engines of that type, on the Seminole, in case priming were necessary?

(Discussion was had as to recess.)

A. May I defer my answer to that, because it may involve a long calculation?

(Thereupon the hearing was recessed until 9:15 o'clock A. M. Monday, November 20, 1939.)

Monday, November 20, 1939, 9:35 o'clock A. M.

Hearing was resumed pursuant to adjournment of November 18, 1939.

Mr. Matteson:

If your Honor please, I would like to interrupt just for a moment at this time. We served a Subpoena duces tecum on Mr. Balfe, the General Manager of Merrill-Stevens Shipyard at Miami, asking him to produce all records of any kind relating to the work that was done at their yard, on the Seminole, in 1927. He is here this morning, but I think Mr. Underwood and I can agree that we have both made requests of Merrill-Stevens to the same effect, and that we are satisfied that Merrill-Stevens have searched their records and that there are no records there in existence with respect to the work which was done on the Seminole in 1927.

The Court:

Let that go in the record, and under those circumstances, Mr. Balfe may be excused?

Mr. Matteson:

Yes, sir.

4141 JOHN A. THOMPSON resumed the witness stand and further testified as follows upon continued:

Direct Examination.

By Mr. Matteson:

Q. Mr. Thompson when we closed on Saturday you were about to make a calculation as to the amount of gasoline required for priming the engines of the Seminole. Can you give us that now?

A. Yes, I have already calculated that, Mr. Matteson, and I have done it on simple lines. I base it with relation to the prior evidence given in this case as to the consumption of both engines, which I believe was in the neighborhood of twenty-one gallons per hour. This consumption incidentally is confirmed by the usual coefficient of .7 of a pint per brake horsepower per hour. These two engines together have twelve cylinders. The engines were four cycle type; that means they have an explosion every second revolution in each cylinder, which means that there are six cylinder explosions per revolution, taking the two engines together. At 450 revolutions per minute, at six explosions per revolution, we get a total of 2700 explosions per minute, or 162000 explosions per hour. Now supposing that the engineer primed all twelve cylinders, each cylinder will then require one hundred sixty-two thousandths parts of twenty-one gallons. Converting the gallons to pints, to make it simple, that is 168 pints. Therefore each cylinder requires approximately 1/100 part of a pint for priming; or the whole twelve cylinders require a total of 12/100 part of a pint. That

is the normal running of the engine. I estimate that in priming, as in the choking of an engine, which has been referred to in this Court as equal to the priming it would be advisable to give a slightly richer mixture, so I have doubled the quantity. We therefore get a final figure, instead of 12/100 part of a pint total, we get 24/100 part of a pint, or approximately a quarter of a pint per priming. Therefore there would be sufficient for eight starts in a quart squirt can, if every cylinder is primed.

Q. Well can you tell us from your experience what would be the effect of using more gasoline than was required to prime them?

A. Well, two effects Mr. Matteson. I think the mixture would be too rich, on the compression stroke, for the spark to fire it; that is one effect. The second effect would be detrimental to the life of the engines, in that a certain proportion of the gas—liquid gas, would flow down the cylinder walls and clean off the lubricating oil upon the cylinder walls, and therefore result in due time to the scoring of the cylinder walls. Those are the two effects.

Q. Mr. Thompson there has been some testimony here with respect to the relationship between the size of a vent pipe and a filler pipe, for gasoline tanks such as those of the Seminole. I think in your original testimony you said that they should be approximately equal. Will you please tell us the reason for the relationship between the vent pipes and the filler pipes?

A. Did I say that in my original testimony?

Q. Perhaps I haven't quoted you correctly.

A. I don't think I said that exactly; because in my experience the air pipe is generally smaller than the filler pipe; it bears a relationship somewhere between half the area to a greater proportion of the inlet pipe. There is a reason why you should have a proportion of not less than half in the area, I should say; that is from experi-

ence; I am not going by rule at all; I am merely stating from experience.

Q. What is the reason for that?

A. The reason is that, to endeavor by those means to prevent building up of presusre from gasoline vapor, in the tank, during the filling process. That pressure should be avoided if at all possible, because it will act on the joints of the air pipe, and may cause gasoline vapors to escape into the chamber where the tanks are laid.

Q. Did you observe when we were on the Seminole in October, the remnants of the wood bracing of the tanks in the tank compartment?

A. I saw certain remains, Mr. Matteson.

Q. What did you observe?

A. Well, I think that is what I did observe. I don't know that I can go into any greater detail than that. I saw certain remains of partly burned timbers. I don't think I could enlarge upon that.

Q. Then let me give you this assumption; assuming that the tanks of the Seminole had bracing between them, or were fixed in place in this manner; that they were set on 4 x 4's placed in the trays beneath them, which were grooved out to a depth of about an inch and a half, to receive the lower circumference of the tank; that between Number One and Number Two tanks, Two and Three tanks, and Three and Four Tanks, there were fitted pieces—separators, fitted to the circumference of the tank on each side, and held in place by 4 x 4 uprights at the forward and after ends of the compartment, but that there was no such bracing at the ends of the installation, that is between Number Four tank and the starboard bulkhead, and Number One tank and the port bulkhead; what is your opinion as to the security—the adequacy of the securing of the tanks, under those circumstances?

A. I consider it would be inadequate.

Q. Why?

A. Why it would be inadequate? Well you gave me—the conditions you set up, you stated that on the port side of the Number One tank, and the starboard side of Number Four tank, no means were provided at all for securing. Therefore if that assumption is correct, I see nothing to prevent Number One tank going to port or Number Four tank going to starboard. I have assumed in my answer too, that there is no criticism of the wording in that particular instance; that is merely as to whether they are adequately secured; is that correct?

A. That is correct. Now what is your opinion with respect to the adequacy of the wooden bracing for tanks installed as those in the Seminole were?

A. Well that answer may be somewhat involved. In the first place I assume that the tanks were placed in from the top, for the reason that I don't think they could have been placed in through the plate on the bulkhead, for reasons I have already stated. First of all you have to prepare your bases before your tanks are in; you can do nothing in the shape of fitting of them after the tanks are in. And I do not consider that you can make a good fitting between, the longitudinal brace you mentioned, for the shape of the tank, with the tanks in position. And I don't think you could efficiently prepare them beforehand. In other words I doubt whether it would be possible to make those braces a good fit, even when the timber was new. Then you have all the disadvantages in connection with timber; I am speaking quite apart from absorption of liquid gas on them. The timber shrinks; and even if they were a dead fit at the time of the fitting, I doubt, myself, from the experience I have had,—not with wood braces in tanks, because I have never used timber of any description in any oil compartment; but from the use of wood in other things, I don't think that you could guarantee that they would remain as close

a fit, in the course of years, as they were at the time,—provided they were efficiently fitted at the time of the installation. When you speak about movement of tanks, I don't mean that those tanks are like four drunken sailors. To me the movement of a tank, where you get stress taken up on pipe lines—for instance the four pipes on the top of those tanks, a movement of an eighth or a quarter of an inch would be serious, in my view. I don't know whether I have answered your question fully there.

Q. I would like to ask you to assume further that the tanks were so installed originally so that there was no means of access to the top of the tanks, and that the tanks were installed as I have described; and taking into consideration also the structure of the vessel with respect to its stability for vibration,—to vibration, as you have already testified; and ask you if you can give us an opinion as to the permanency and security of the piping, including both the gasoline lines, the filler lines, and the air vent lines, under those circumstances; and taking further into account the fact that these tanks had been installed some twelve years before the time that I am speaking of in 1935.

A. Well I don't want to be critical of your question, Mr. Matteson; it is very complimentary to me; I think there are a lot of questions there. May I paraphrase that?

Q. Yes.

A. Take them in stages as far as I can recall from what you said. I am to assume, am I, that the tanks are placed in, and shortly after, or immediately after, the opening at the top was closed in. Take that condition first; from my observations of the wreck only, I do not think it would be possible for anyone to get at the joints of the air pipe. And then dealing with that point only, I don't think, in view of the vibration, the slightest vibration, of a ship over the period you have mentioned, that

those joints would remain good joints. Then I think you referred to the effect of vibration on the other piping,

Mr. Matteson?

Q. What?

A. You referred to vibration on to the filling line and the discharge line?

Q. Yes.

A. Well of course the conditions there are different. Supposing those joints did become loose, the engineer could tighten those joints up, because they come inside of the engineroom. Provided he noticed that they were lacking in tightness, I think that he could make them good again, in spite of them coming loose at any time or times, as a result of vibration, or any other cause. Is that what you wanted?

Q. I think that covers it all right. It has been suggested, Mr. Thompson, that if the piping system put in the gasoline pipes, were properly installed, that there would be no occasion for the development of leaks of any kind during the life of the vessel, or at least for long periods. What in your opinion would be the situation in that respect as far as the installation on the Seminole was concerned?

A. I don't think so; of course I have never come across any installation, however good, that didn't require constant attention. That's my experience, Mr. Matteson. You see you have a peculiar condition in this boat; we have—I think probably I am partly to blame as much as anyone else,—we have used a term called manifold pipes. Well of course this boat didn't have a manifold pipe at all; perhaps I ought to have stated that in my earlier testimony, but I adopted the term which someone else had used. In my opinion this boat didn't have a manifold pipe. I am referring now to the discharge pipe that is connected up to the tanks; and I think you have a sample of it here.

Q. Is that what you refer to?

A. This has been stated as part of the manifold pipe.

Q. Referring to Exhibit 2.

Mr. Underwood:

What is the number?

Q. Number 2.

A. If the whole of the pipe line, assuming the whole of the pipe line,—this is typical of the whole of the pipe line running along the front of the tanks and connected to the tanks. I don't know how many joints there are here,—there would be in the whole thing; but to me, I don't like to be hard, but I still stick to the opinion I stated before, that it is just merely a contraption, a series of pipes, with all those possible means of leakages. I do not consider that that vessel had a manifold line at all.

Q. Well, what would be properly described as a manifold?

A. Well, a manifold pipe is one piece of pipe having on it brazed or cast on junction pieces; one set brazed on, or junction pieces, being for connection to the inlet; on the other side a series of junctions,—pieces, connecting the discharge from that line. Then at the end of the manifold pipe, the only manifold pipe I have ever fitted, we have blank flanges which we can clear out the full length of that manifold pipe. The manifold pipe is the same thing as you have in pumping systems; we have manifolds of various types that are used in the same way I just described.

Q. What would be the difference in effect between a manifold pipe such as you have described, and the piping made up as Exhibit 2 is?

A. It would be considerably stronger and more rigid, and very much fewer joints. Do you wish any more on that?

Q. I think that is all right.

A. I am not criticizing anyone for the use of the word, manifold pipe, because I have used it myself in this case.

Q. I call your attention to this other instrument, Number 11. It has been suggested here that a satisfactory gas tight joint between the union and the Crane valve Number 150 would be formed by bringing the face of the union in contact with the surface—connecting surface of Crane valve 150. What is your opinion with respect to that?

A. This opinion is just merely on the tightness?

Q. Yes.

A. Whatever I may say, I admit that these valves have been through a fire—in my opinion a serious fire, even at that spot. May I just look at these?

Q. Yes.

A. Because I may say right away, fire or no fire, I consider that prior to the fire the thread in this joint,—these threads here, did not act as a joint at all. It is my opinion that the joint merely consisted of this surface here.

Q. Meaning the end of the union?

A. The end of the union; with the nut,—the cast on nut face of the valve, formed such joint as there was at that time. May I just look to see if there is any evidence that could not have been destroyed in the fire? Am I allowed to clean this up or not?

Q. What do you want to do with it?

A. I don't want to touch an exhibit unless it is agreed, your Honor. Well, I can't very well see the surface of this nut face without scraping it, you understand.

Q. Which surface are you speaking about?

A. I can then tell you what type of machining was done on that nut, if I can scrape this thread off. Before I do it, I would want permission.

(Exhibit examined by Mr. Gibbs.)

Q. What do you wish to do, just clean a small section?

A. I just want to clean a small section.

Mr. Matteson:

Is there any objection to that?

A. I wish to give my evidence right.

Mr. Underwood:

I suggest that if there is going to be anything done to this, it be done to the other side. Both sides were made at the same time, and presumably the same way.

A. I couldn't give an opinion of one side from the appearance of the other, your Honor.

Mr. Underwood:

Does the witness think they made one end one way, and the other end the other way?

A. I have no thought about it. If you wish me to give evidence on the appearance of that face, I have to examine that face, and no other. I wouldn't give evidence on any other basis. It isn't serious at all, your Honor, it is a simple matter, your Honor; it does not destroy any evidence at all.

Mr. Underwood:

If your Honor please, I think if this valve is to be mutilated at all, it ought to be at the end not forming a part of the connection in question. It seems quite obvious to me that that valve was made the same at both ends. If we mutilate the face of this it is going to distort the picture as to how the one came in contact with the other. I have no objection to doing it at the other end.

(By Mr. Matteson):

Q. Mr. Thompson assuming that it is agreeable to counsel on the other side of this case, to assume that ma-

chining if any, on one face of the valve, is the same as on the other, was the suggestion made, that you scrape the other face of the valve, satisfactory to you?

A. No, sir; if I have to give evidence on any particular thing, I give evidence on that, and not on anything that may be like it. I have no proof that the same care is taken at one end as at the other. I would be perfectly agreeable for Mr. Gibbs to do the cleaning; I don't want to do it. He may take the fitting and use my knife.

Q. And as I understand it, what you would like to do would be to clean just—

A. The dirt off.

Q. A small section of the valve?

A. Just a matter of an eighth of an inch or a quarter of an inch long, at any part they would like to clean.

Q. And what is the purpose for which you want to do that?

A. I want to examine the surface of the metal.

Q. For what purpose?

A. To see how it was machined. In my opinion, those surfaces form the joint. To examine the joint; I am going to give testimony on that and I want to give it properly.

Q. I think possibly what counsel may have in mind is that it might interfere with any subsequent test by blowing through the valve. Did you have in mind making any such test?

A. No.

Q. Does that cover your point?

A. If it is not agreeable, I am prepared to do the best I can with the joint as it is; but it is subject to that reservation, your Honor, that I would prefer to have it partly cleaned, so I could be more accurate in my observations.

Mr. Botts:

If I might suggest, it is the same sort of a test as they put a chock on a valve the other day to make a test of it; and certainly it seems to me that for the purpose of giving accurate testimony, a test—cleaning off a little part of that couldn't possibly destroy any evidentiary value that it might have.

A. To shorten matters, Your Honor, I would be agreeable to give certain evidence with that qualification,—on that face. You must remember I am to be cross examined, and I wish to put my evidence—

The Court:

Here is a thought about giving the witness permission to change something, that some contention might be made that is not apparent to the Court now; with the present situation. I just hesitate about changing something when some objection is made.

Mr. Matteson:

Well that's quite all right, if your Honor please; I will ask Mr. Thompson to go ahead and give the best testimony he can without actually cleaning the surface.

The Court:

I see a difference between adding a chock and taking something away.

A. Has anyone a magnifying glass?—May I go to the window, your Honor, for better light.

The Court:

Yes, sir.

A. I am satisfied, your Honor, to give evidence on the joint as it is.

Q. Now will you tell us—

Mr. Botts:

Does it appear in the record that the witness examined it under a magnifying glass?

The Court:

Will you let that appear, Mr. Bryant?

A. I am now referring to the one face of the joint, the face on the valve itself. In my opinion this face has been machined but not ground; and therefore does not constitute a satisfactory face for a gasoline joint. I observe tool marks on this face, machine tool marks, which indicate to me quite clearly,—that isn't something that has been altered by the fire—it indicates quite clearly to me the original facing of this valve. And I can see quite clearly tool marks on that. I think you can even see them with the naked eye, but I wanted to be pretty precise. The other face I haven't looked at. I won't alter that, I will do the best I can with them. That seems to be dirty; may I go to the window?

The Court:

Yes, sir.

A. I can't get quite so close to this face with this magnifying glass, but I think even with the naked eye the same condition can be observed on the other face of this joint; that is the face of the nipple—the union, rather. In my opinion those two surfaces coming together would not form a gasoline joint: that is with the very loose condition of the threads, which in my opinion were just as loose before the fire. I am just expressing an opinion, your Honor.

Q. You spoke of looseness of the threads. What is the significance of that?

A. It means the threads are not taking up any part of the work in making a gas tight joint; and you can see

when you get right up, you get movement on the threads; I don't know whether you can observe that. Those threads are quite loose. So in my opinion the joint there is on the face of that valve only. Is that all you wish me to say in connection with this?—I am further of the opinion that due to the design, this part, this valve which is marked Crane 150, I think it has an exhibit number, but it is marked 150,—is the valve, I take it, that was attached to the draw-off pipe. The Crane valve 125 I take it was the valve used for filling cans, of any description, or for any other purpose. It is only secured by the joint itself, and the least touch of that, with that leverage, may,—or at least any force applied to that leverage:

Q. What leverage?

A. Leverage as from the center of the valve to the valve wheel.

Q. Which valve are you speaking of now?

A. Speaking of Crane 125; may tighten it; on the other hand it may slack it. The valve stuck like that, by that leverage, only supported by that joint.

Q. Well what in your opinion would be the result of the fact that the threads are not tight, and the faces are not in your opinion a satisfactory connection for retaining gasoline?

A. My opinion is, this valve failed to hold back the gasoline.

Q. You are referring now to 150?

A. To 150; either through some fault in that valve, or through failure to close, I don't think you get a gas tight joint on the outlet side of the valve 150,—not a satisfactory, gas tight joint.

Q. Now Mr. Thompson you were present in Court the other day when a test was made on these valves, and on another exhibit, by blowing or sucking through the connection. What is your opinion as to whether or not that is a satisfactory test for gasoline tightness?

A. I wouldn't consider that a satisfactory test at all.

Q. What would such a test show?

A. It would show it was air tight up to the pressure that was applied to it; it would show that.

Q. In your opinion, would that indicate whether or not that was tight for gasoline?

A. Not in my opinion.

Q. Now it has been suggested here Mr. Thompson that the angles, or L's, the L connections in a set-up of brass pipe would have the effect of coils in protecting against vibration. What is your opinion with respect to that?

A. May I see the article which is referred to?

Q. Well for example I refer again to Exhibit 2, the angle connections in that.

A. Just these elbow pieces? You mean these elbows?

Q. The elbows, yes.

A. And the point of the question is, Mr. Matteson, please?

Q. As to whether or not such connections would act as coils in absorbing ventilation, or protecting the installation against the results of vibration.

A. I will answer that question simply, no. On the contrary these elbows would be subject to concentration of stress; and in my opinion would form a dangerous method of fitting up a gas line. By concentration of stress you have the stress concentrated at the elbow itself; and I consider that most unsatisfactory.

Q. Why?

A. Because it would be apt to cause a leak at the elbow; apt to cause leaks at the elbows.

Q. Now it has been suggested here that coils for absorbing vibration, are not used with brass pipe. What can you tell us about that?

A. Not used by whom, Mr. Matteson?

Q. Not used by shipbuilders, as good practice, in installations of brass pipe.

A. Well, that is contrary to my experience.

Q. It has been suggested that such devices are only used where an engine is mounted on rubber. It has been suggested that that results in increased vibration on pipe lines. What can you tell us about that?

A. At where, Mr. Matteson? Pipe lines where? Immediately adjacent to the engine?

Q. Yes, we will assume that.

A. I admit that; I admit that there is, on rubber mounted installations, increased vibration on the joints immediately adjacent to the engine. But the rubber mounted engines do not cause any greater vibration than engines that are not rubber mounted. The difference is,—the object of the rubber mounting is to absorb the vibration in rubber and not transmit it to the hull; that is the cardinal difference.

Q. In the case of engines mounted in rubber, what would be the effect, with respect to vibration on connections further removed from the engine?

A. Well, that's an indefinite thing too, Mr. Matteson; you have to state then the distance. In my opinion, just generally speaking, the vibration on the pipe would reduce as the length increased. Is that what you wanted?

Q. Yes. Now it has been suggested that copper tubing is objectionable for use in gasoline piping, because it is liable to injury. What is your experience with respect to that?

A. What type of injury are you suggesting, Mr. Matteson?

Q. Well, dropping a wrench on it, or stepping on it, or some physical damage.

A. Oh, physical damage? Well the risks vary so considerably, I can only give you a general reply. I don't know what physical damage may be caused to anything, anywhere, at any time. But assuming equal conditions, the effect of physical force applied to a copper pipe,—

that is annealed copper pipe, would be to close partly or wholly—I doubt wholly,—the copper pipe; flatten it out, in other words. Unless the blow was very severe, I think that would be the whole effect of the application of such force. To substitute brass pipe for copper pipe on the grounds that the brass pipe would not close up, but copper pipe will, I don't think that that is a risk that a designer of installation of a gasoline engine in a ship, should take into account. The much more immediate thing, is the hazard, the known hazard, an unknown hazard you are referring to now. The known hazards are provided for, and the unknown ones as far as they may think they go. But you protect a pipe from the possibility of physical damage, by running it under protection, to whatever extent you think necessary but the advantages of copper pipe, against the known hazards, are so great that in my opinion,—I am merely expressing my opinion based on experience,—that copper pipe has so many advantages over brass pipe that I have invariably fitted copper pipe, annealed copper pipe, myself.

Q. It has been suggested that copper pipe is only used for cheapness. What is your opinion with respect to that?

A. Well if you had—I confess quite frankly, just for the moment, I don't know the difference between the cost of new copper and brass pipe; it has been some time since I bought any; I believe the market fluctuates so, I couldn't say. While you consider in the building of anything, or the installation of anything, the matter of cheapness, I don't think is applied to minor articles. The difference in cost, supposing brass pipe were cheaper, and it costs more labor to install it, the difference ultimately in any installation would be so trifling that I don't the matter of cost would be taken into consideration: at least that is my opinion.

Q. It has been suggested that copper tubing, or copper pipe, is objectionable because it is subject to vibration. What is your opinion with respect to that?

A. May I have that question read?

(The question was read by the reporter.)

A. Everything is subject to vibration, in a ship. Brass pipe is subject to vibration; copper is subject to vibration. But in my opinion, copper pipe will absorb vibration, take it up, without damage, much more readily and much more certainly than brass pipe. In fact I think I can say that that is probably one of the principal reasons why we use copper pipe almost exclusively, if not exclusively.

Q. Mr. Thompson, referring to your observation of the Seminole in October of this year, it has been suggested that the side of the bulkhead in the passageway, separating the passageway from the engineroom, had at some time been covered with wooden sheathing or paneling, set out from the bulkhead. From your observation, can you tell us whether or not that was the fact?

A. In my opinion, the starboard side of that steel bulkhead had never been fitted with any wood lining.

Q. Why do you say that?

A. Well, I say that in a negative way. I didn't find, myself, any signs of means of attachment of any such wood lining on the steel bulkheads.

Q. And what signs of attachment would you expect to find, if such sheathing had existed?

A. Well a considerable number of holes in the steel plates, for the attachment of wood backing pieces, wood framework, behind the paneling or lining; tongue and groove lining, or whatever may be suggested.

Q. Did you find any such condition on that bulkhead?

A. No, sir.

Q. Mr. Thompson, it has been suggested here that on the Seminole before the fire there were four two-inch pipes leading from the deck above the engineroom, down through the passageway, close to the bulkhead between the passageway and the engineroom, in approximately the positions marked by the four white dots as shown on this exhibit, which is Phipps' Exhibit A. Did you observe any physical condition on the Seminole which would indicate whether or not such two-inch pipe had led down alongside that bulkhead prior to the fire?

A. I couldn't say, sir, because you have limited your question to, led down alongside the bulkhead. If you mean, and carried through to the bilge?

Q. Carried through to the bilges, yes.

A. Of course that is different. I am quite certain that there were no such pipes.

Q. Why?

A. Because that longitudinal bulkhead foundation plate was free of holes. It was in a badly corroded state, but I looked for the possibility of holes, and I am quite positive that no pipes at any time were led through that foundation plate.

Q. Now what is the foundation plate? Describe that to us.

A. Well, I didn't prepare this little rough sketch for that purpose; but I think, to avoid drawing another, we might as well use it; if I can find it. Yes, the sketch is here.

The Court:

Are you going to put that in evidence, now?

Mr. Matteson:

Well what is this sketch that you have produced, Mr. Thompson?

A. Well it is a diagram sketch representing I will say the starboard side; that is a cross-section of the boat,

through the tank chamber. I think that would be,—it does not extend right to the deck; it is the lower part of that part of the boat. Here we show on the left-hand side of the sketch, the upper corner, Number Three tank, or the adjoining Number Four; and in the upper right-hand corner of the sketch we get a cross-section of the passageway. Down here, running vertically—do you wish me to mark it any letter?

Q. Yes, you might mark that with the letter—

Mr. Underwood:

It is already marked.

A. That ought to be sufficient.

Q. Suppose you indicate the bottom of that line with the letters AB, with A at the top and B at the bottom.

A. May I just put one letter on there?

Q. All right, the letter A.

A. A, in a circle. That is the window; that is a section through, looking forward and aft,—a vertical section. At the bottom of that plate there is a foundation bar, that is an angle bar. Shall I indicate that by another letter?

Q. Yes, make that B.

A. That is the angle B. The vertical flange of that angle is riveted to the plate marked A; the horizontal flange is riveted to the foundation plate I have referred to. Shall I mark that C?

Q. Yes.

A. That is C,—that plate. That is the foundation plate that I referred to previously. Now my answer was based on the fact that I failed to discover any holes through that plate, through which those vertical pipes to which you refer must inevitably pass, to get down into the space below.

Q. When you say, holes through that plate, you refer to the foundation plate which you have marked on this diagram, C?

A. C; that is right, sir.

Q. What was the width approximately of that plate, can you tell me?

A. I would have to give that from memory; I think that was approximately eight inches.

Q. And then if such a pipe had passed down through the passageway, I take it it would have had to be further from the plate?

A. Yes, it would have to be a distance out far enough to clear the edge of—more than that, really; because it would be connected by a flange, a pipe flange to that plate; so actually the plate would be a minimum of eight inches and possibly ten inches; that is the inboard side of the pipe would be a minimum of about ten inches away from that bulkhead. So therefore the space occupied,—the space between such linings you have described, would have to be in my opinion ten to twelve inches away from that plate, to cover such pipe as you have referred to, if those pipes did not come through that foundation plate.

Q. Now what other matters have you covered in this diagram that you have prepared?

A. I don't quite follow that.

Q. I notice that other things are indicated on this diagram.

A. Well I did that just for my own purposes, to find the relative position really of the so-called drain pans, in relation to the water line. Do you wish any more? You have the general—it shows the web plate in the passageway; it shows the wood guard on the side; it shows merely in approximation, because I don't know the width of these floors, and at the time I drew this I thought she had a flat plate keel; but it does not show the bar keel. But that is really what I drew it for, Mr. Matteson, just to illustrate,—put down for my own satisfaction the relative distances from the keel, of the so-called drain pans, to the load water line which was given in evidence as four feet.

Q. But have you located the tanks with respect to the bottom of the ship, in this diagram?

A. Oh, I located that from a dimension that we took on the boat, which gave a distance of forty-five and a half inches from the bottom of the boat to the center of the discharge orifice on the tanks. Then I took four and three quarters from that center down, as representing the bottom of the tanks. And I took a distance of two inches as the depth of the bottom—as the tray below the tank. I have not put in these—these wood pieces are not supposed to represent in any way the actual scantling size of the wood pieces in the bottom of the trays; I was not trying to illustrate those. That is the one thing I wanted to show, for my own satisfaction, the depth of the tray from the water line.

Q. And what did you assume the draft of the vessel to be?

A. Well I took that from the evidence given by Captain Baker; he gave the draft at four feet forward and four feet aft; therefore of course four feet amidships; and I think that is where I got the four feet from.

Q. What did you find the relative position of the bottom of the pans, and the water line, to be, with that draft?

A. I have already stated that; you don't wish me to answer that again, do you? I think that is already given.

Mr. Matteson:

I would like to offer this diagram in evidence.

A. It is a rough thing; I am sorry I brought it. I wish to say, your Honor, that I didn't make that for the Court; there may be things on it I could be criticized for; little things, inaccuracies. But I did not intend to put that up, otherwise I would probably have taken greater care in certain details.

Mr. Botts:

It is a cross-section of the boat, so you are looking forward. Is that clear, that that is what it is?

Mr. Matteson:

Yes.

The Court:

I think that the diagram may have some usefulness in helping to visualize and explain the witness' testimony; not that it speaks as an independent document, substantiating different matters as set forth on there; but it may be helpful. I certainly think it would be helpful to me in studying his testimony in regard to that; so for that reason I will admit it.

Mr. Underwood:

I have assumed that is what it is offered for.

(The said sketch was admitted in evidence and filed as Libelants' Exhibit 148.)

(By Mr. Matteson):

Q. Assuming these two-inch pipes did lead down through the passageway, and did not go through the foundation plate, and that the wooden sheathing and paneling was outside of the two-inch pipe, further into the passageway; what would be the minimum distance from the bulkhead which the passageway side of that sheathing or paneling would necessarily be?

A. Assuming they didn't go down to the bilges?

Q. Assuming they went to the bilges, outside of the foundation plate?

A. Assuming they went through the plate?

Q. No, assuming that they did not go through the plate but did go through the passageway outside of the bulkhead?

A. I think I have already—haven't I stated that?

Q. No, you haven't stated that.

A. I am sorry; do you mean, to the center of the pipe, or to the inboard or outboard side of the pipe?

Q. No, I am not talking about the pipe now; I am talking about the sheathing or paneling that was outside of the pipe; how far would that have had to be from the bulkhead if the pipe ran through the passageway but was outside of the passageway?

A. I will answer that again; a minimum of ten to twelve inches. I think you will find in the record I have answered that question.

Q. These two-inch pipes are said to have extended through the upper deck, and to have been finished with goosenecks, so that the end of the pipe was reversed and faced downward toward the deck. What would be the effect of that arrangement, so far as ventilation is concerned?

A. Well they would merely act as exhaust pipes, not inlet pipes.

Q. There has been some reference to Lloyd's rules which have been marked as Exhibit 101 and 101-A; and the suggestion has been made that they refer solely to vessels of seagoing type. Will you tell us whether or not that is a fact?

Mr. Underwood:

We object to that; the rules are the best evidence.

The Court:

What about that, Mr. Matteson? Don't the rules show that?

Mr. Matteson:

If your Honor please the rules show it clearly; there is no qualification in the rules. The witness on the other side has testified that they do not refer to inland vessels.

In view of that I think I am entitled to have this witness say they do; but the point is perfectly obvious, in any event.

The Court:

There has been testimony that those rules did refer to non-seagoing—

Mr. Matteson:

The witness on the other side said that they did not refer to non-seagoing vessels.

Mr. Underwood:

I don't think that is quite a correct statement of what the evidence shows. I think what my witness said was, that they are not used for anything but seagoing vessels in this country. At all events, the rules themselves are the best evidence as to what they cover.

Mr. Matteson:

Well I will reframe the question then, in view of Mr. Underwood's statement of what his witnesses have said.

The Court:

All right.

(By Mr. Matteson):

Q. It has been suggested here Mr. Thompson that these rules are not used in this country with respect to non-seagoing vessels. What do you know, from your experience, with respect to that?

A. Well, you would limit it now to vessels in this country? Would you say the Great Lakes, for instance,—include that as seagoing? I am in a difficulty right away. Your Great Lakes here, you have conditions equal to the sea; but I don't know if you call that sea-going or not.

But eliminating the Great Lakes, to my knowledge, without being able to give you the names of the vessels, to my knowledge vessels are built and have been built in this country, to Lloyd's class, for inland waters and protected waters.

Q. Mr. Thompson it has been suggested that there is a difference in the standard of safety applicable with respect to vessels in Florida waters and in the North. What is your experience with respect to that?

A. May I have that question read?

(The question was read by the reporter.)

Mr. Matteson:

Strike out, "of safety".

A. Standard—I don't quite follow. A difference that I personally would—

Q. Well, limit it to the subject of ventilation in gasoline vessels.

A. I know of no difference, myself; I have never heard of any difference.

Q. From your experience can you tell us whether there is any difference in the conditions under which vessels of the two areas operate, that would bring about such a difference?

A. Well I survey vessels up north in the summer, and vessels down here in the winter, and I think the conditions are so equal that I can't distinguish between them, frankly. I make no difference whatsoever.

Q. Now there has been some evidence here with respect to zinc plates. I am not sure whether you have stated in your testimony before, the purpose for which zinc plates are used?

A. I don't think so; I think I referred to the item in the bill.

Q. What is the purpose for which zinc plates are used?

A. To absorb electrolysis.

Q. And what is the cause of electrolysis? What is electrolysis?

A. Electrolysis—the result of electrolysis is the pitting and eating away of ferrous or non-ferrous metals, inside and outside of the ship.

Q. What conditions produce electrolysis?

A. Well I haven't qualified as an electrician, because I am not an electrician. I speak from my experience as a shipbuilder and a ship surveyor. I believe,—I say in my opinion, electrolysis is caused by stray currents acting on one or more metals, especially in the presence of water, or it may be even damp air at times; but as far as my experience, in the presence of water, especially with salt water.

Q. What do you mean by, stray currents?

A. Well that is a term we use for—in shipbuilding you might almost say leakages, if you like, from the electrical system inside the ship.

Q. Now assuming that 175 pounds of zinc plates were used on a vessel of the size of the Seminole, averaging about five pounds apiece, indicating about 35 zinc plates; from your experience would that indicate anything to you with respect to the condition of the Seminole?

Mr. Underwood:

I object to that. How can he tell? That goes to the attitude of mind of the man who decided to install that many zinc plates.

The Court:

I think he is entitled to express his opinion. Overrule the objection.

A. May I have the question read?

(The question was read by the reporter.)

A. Well in view of the fact that on the average would be three to four times the number of plates used in a vessel of the size and type of the Seminole, it would indicate to me that undue corrosion, in the form of electrolysis, had been noted on the hull of a vessel, and in order to counteract it, this unusual number of plates had been fitted; and would briefly indicate that the electrical system in the ship was unusually faulty.

Mr. Underwood:

If your Honor please, I move to strike that out on the ground that it is pure speculation. This witness is drawing an inference from the fact, as he assumes, that there were 35 zinc plates put on this boat, that the electrical system was unduly faulty. Now it is the height of speculation, because this was done at a time when the steel plates of the ship were being almost completely renewed; and it is equally possible that it was done as a pure matter of precaution, and for no other reason, without any fault of the electrical system at all. In other words what he is doing is, assuming certain facts, and purporting to testify to the reasons why it was done. I don't think that advances us along the line of our inquiry in this case one step.

Mr. Matteson:

If your Honor please, in any case, this must be naturally built up on inference. No particular thing can ever be termed conclusive evidence of any definite conclusion. I think we are certainly entitled to have the facts and the conditions fully developed, so that whatever proper inferences can be drawn, can be drawn by the Court. It isn't a case before a jury, where the jury can be misled. The Court can draw proper conclusions and give proper weight

to the testimony. It seems to me it is perfectly proper for the answer to remain in the record.

The Court:

I think the answer should be regarded in this light; as we have no jury; that in his opinion the presence of that number of plates would indicate that there was something wrong, in his opinion, which called for the presence of that many plates. As to what was wrong, I think that is a matter for the Court to determine.

Mr. Matteson:

Absolutely.

The Court:

And not for him to determine and express an opinion. I don't regard his testimony as to something unusually faulty; I don't think that is properly in the record. I think it should be regarded as I have thus indicated. I will allow it to stand as it is, with those observations, and permit cross examination to proceed on that basis.

(By Mr. Matteson):

Q. You used the phrase, unduly faulty. Let's eliminate that, and tell us what conditions you think, in your opinion, these indicate?

Mr. Underwood:

I object to that as speculative, your Honor. This witness is being asked to express an opinion as to the condition of the electrical system on this boat, from the fact that some bills made a charge for 35 zinc plates. I have never heard a question put in any lawsuit that called for more speculation than that.

Mr. Matteson:

I am simply trying to meet the possible objection to his previous answer; eliminating the question of, unduly

faulty, and state specifically the conditions that he referred to; let someone else say whether they were faulty or not.

The Court:

Well I think you are entitled to ask him, Mr. Matteson, as an expert, in his opinion with what knowledge he has, and what he has seen, together with his experience and so forth; true he is not attempting and hasn't qualified as an expert electrician; but from his experience he can state, within the realm of speculation, what unusual conditions would fit in with that. But as to a conclusion from him, I think that is wrong.

Mr. Matteson:

I think that is a very good suggestion.

Q. Put it this way, Mr. Thompson; what conditions, on a vessel, in your opinion, would fit in or coincide with the use of this number of zinc plates on a vessel the type of the Seminole?

Mr. Underwood:

If your Honor please I would like my objection noted to this entire line, once and for all, so I needn't interrupt any more, please.

The Court:

All right.

A. May I have the question?

(The question was read by the reporter.)

A. I don't wish to transgress; I wish to take great care in answering that.

(The question was re-read by the reporter.)

A. In my opinion the presence of an unusual amount of corrosion in the shell plating of the vessel. In shell plating, I include all parts under water.

Q. Now, Mr. Thompson, it has been suggested it would be a simple matter to make a hydrostatic test of the tanks of the Seminole, with the installation as I have described it to you. What would you say? What is your opinion as to that? What would be involved?

A. The question is what would be involved in making a hydrostatic test on the Seminole? Well, a hydrostatic test in the first place involves the testing each tank separately. In the installation as it appeared to be on the Seminole, that is, the inaccessibility of the air pipes in the top of the tank; I don't think that the test could be made without removing whatever was above the tanks, so as the air pipe would be removed and the riser pipe fitted in its place. I think it would be a most expensive matter, tremendously expensive matter; a most difficult matter, to test the tanks as I believe they were installed on the Seminole.

Q. Now, Mr. Thompson, it has been suggested with respect to ventilation in the engine compartment of the Seminole that with the ventilation that the engineroom had, consisting of the large funnel ventilators, the roof of the engine compartment, the skylight, the hatch, the windows at the upper part of her sides; that this, assisted by what has been termed as the force of convection, meaning the tendency of gases to rise, due to differences in temperature,—would be adequate to adequately ventilate the bilge of the Seminole and the lower part of the engineroom, with respect to gasoline vapors which might accumulate there. What is your opinion with respect to that?

A. I couldn't agree with that. I don't think so.

Q. Why not?

A. Why not?

Q. Will you explain?

A. In that assumption you have got the hatches on the top deck open, have you,—or closed?

Q. Yes, I will grant they are open.

A. Well, I agree of course that there was convection; I think the force of convection there was negligible; that such force as it is would add to the danger rather than detract from it. I think it would, without removing the gases, have the tendency to disturb the gases and to bring them into contact in the lower part of the bilges and mix them with air within the explosive range. Of course I am not a chemist, I can only speak from my experience as a surveyor, and from the knowledge I have gained from cases similar to this, and in hearing the expert evidence of others, and being in consultation with them. And I have learned, correctly or incorrectly, that gasoline vapors have not the same specific gravity all through; that broadly speaking, part of the gas is more volatile than the other part. I have noticed the effect of that myself; and one effect is that, after an exhaustive inquiry in behalf of one client, the United Carbide Company, I failed to discover in this country any case of a gasoline explosion that was not followed by fire, even in spaces where there was no observable combustible before the fire. And I have had other cases which satisfied me that the action of gravity on gasoline vapors causes the gas to quite quickly fall into the lower parts of the vessel the gas is in. And part of that gasoline vapor, in vessels I have experienced, in a matter of thirty or more gasoline explosions, condensed in the lower part of the ship. That is applied equally to steel vessels and wood vessels, and probably accentuated by the presence of bilge water. We have had several explosions from cooking gas, one in particular, the one I referred to, the United Carbide Company explosion in Detroit, that I looked into for them; that was an explosion that was not followed by fire. But I think that the forces you are referring to,—convection, may and

probably do disturb the more or highly volatile section of the gasoline vapor, and bring it up into the space above, where the heavier gasoline vapor remains. So I am of the opinion that convection is not in any way at all—to any marked degree I mean, useful for the removal of heavy gases from the lower part of a vessel; that is the heavier proportion of gases. But I think convection does disturb the lighter gases, with the result that you can frequently smell gasoline in a chamber where possibly you have no other force present, but the force you refer to,—convection. But I do not consider that the force of convection need be taken into account whatsoever when one considers the matter of ventilating the lower part of a ship.—Is that what you wish?

Q. Yes. Why do you say it need not be taken into consideration in ventilating the lower portion of a ship?

A. I think that force is so negligible in that respect,—I admit you have a rise and a fall, I think you have it in most houses and buildings, as far as I know, those that I have seen, depend upon the heating of a room or building through the very force you mention; you have certain radiation from a radiator, you get the convection conduction perhaps. But I think the greatest effect you get from so-called radiators, is convected heat.

Q. Well in your opinion would such forces be adequate to remove gasoline vapors completely from the bilge or lower part of the engineroom, if such vapors had accumulated there?

A. Definitely no; and unfortunately no. It would be a very much simpler problem in shipbuilding if we could in any way count upon the service of convection to help us to ventilate the lower portion of a ship.

Q. And if those forces are active, but not adequate to remove the gasoline vapors, what is the result?

A. May I have that?

(The question was read by the reporter.)

Q. I refer to the forces of convection.

A. I think I have already answered that; do you wish me to repeat?

Q. I don't want you to repeat anything, no.

A. I thought I answered, I intended: I thought it would have a disturbing effect on the more highly volatile part of the gasoline vapor, and would mix that vapor with the air, and possibly bring it into the explosive range which may result, if you apply a spark or some other form of ignition, to that particular spot, may or would actually if it were in the explosive range, result in an explosion.

Q. I want to contrast two conditions here. Supposing you had an accumulation of gasoline vapors in the bottom of a compartment, such as the bilge or engineroom of the Seminole, which would be the most dangerous situation; when you had convection present, or convection not present?

A. Oh, I thought my answer would imply that immediately. I think actually it would be more dangerous with convection, because without convection I think your gases would lie dormant, or more or less in a static state, and due to specific gravity would continue so to lie. And in the condition you have no movement at all, I don't think those gases—I think those gases then would be in the non-explosive range.

(A brief informal recess was had.)

Q. Mr. Thompson it has been suggested that there would be some difficulty in designing a vessel such as the Seminole, for the purpose of removing gasoline fumes which might accumulate in the bilge or the lower part of the engineroom, because you would not know how much of such gasoline fumes you might have to remove. What is your opinion as to that?

A. Well, the problem of ventilation is not affected by the amount of fumes you have got. The only problem is

the cubic capacity of the space you are ventilating. That is the only problem of the naval architect. Larger spaces have to have larger means of ventilation. It is in direct ratio to the cubic capacity of the space, and you don't take into consideration anything else. It is only a question of the removal of the air in a known space, known cubic capacity. I have never heard that you have to take into consideration the quantity of gas vapor that may or may not come into that space.

Q. It has been suggested that there is no evidence, in the present condition of the Seminole, of there having been an explosion in the vessel, at the time of the fire. What is your observation with respect to that?

A. That is, of the wreck as I have observed her?

Q. Yes.

A. In my opinion there is quite good evidence of an explosion, in the wreck as I have seen it.

Q. Will you explain?

A. Well I am just merely stating an opinion; that my observation of the wreck of the Seminole is that there was quite a violent explosion, and that it was principally in the tank chamber. I am not basing that on the position of the tanks whatsoever; I don't know if they were in that position immediately after the explosion, or not. I was not at the fire, and I don't know. I am just basing it on other observations.

Q. Please tell us what your observations are.

A. Well as far as observations are known, I base it upon the condition of the bulkheads forming the tank compartment.

Q. Describe the condition you refer to.

A. The condition I refer to in the tank compartment, is that the bulkheads are splayed away from one another, opening out. One looking aft, that is the after bulkhead of the tank space, and the forward bulkhead splayed towards the bow of the vessel. In other words you have

a much wider space at the top of the tank compartment space, than you have at the bottom.

Q. Can you point it out to us in the photographs which are in evidence; in this photograph, Libelants' Exhibit 6—this is the original 6?

A. Point out what, Mr. Matteson?

Q. What you just described.

A. Well this photograph confirms what I observed, that the forward bulkhead of the tank compartment had been forced in a forward direction; that the after bulkhead had been forced in, an after direction,—direction towards aft. That the space at the top of the tank compartment, of the bulkheads, was very much greater than the space at the bottom of the compartment. From that observation I concluded, rightly or wrongly, that at least in this compartment there had been a violent explosion.

Q. You refer to the compartment in which the tanks were?

A. Yes, in the tank compartment.

Q. Is there anything else that you wish to call our attention to?

A. Not from observation, I don't think, Mr. Matteson; not as to explosion.

Q. Was there anything else that you can refer to in the evidence in this case, with respect to the subject of explosion?

A. Well I have a fair knowledge of the evidence that has been given here, having listened to the most of it.

Q. Be sure to state what you are basing your opinion on.

A. I will. There is one particular piece of evidence given, was given, in relation to this photograph—I don't know what number this is.

Q. Which one is that?—That is 3-W.

A. Well, I am not speaking now as to the evidence given on the photograph, I am speaking as to the photo-

graph itself; observations made from the photograph. It appears to me that at that period, the period the photograph was taken, I am meaning—I don't know when it was taken,—that the tanks are definitely misplaced. In my opinion, from the evidence given as to the ingress of water in the early stages following the fire, it is my opinion that those tanks did not float, or were not displaced out of position by a flotation; that that displacement of the tank there, in my opinion, was due to an explosion on board the Seminole.

Q. Why do you say it was not due to flotation?

A. Well, I understood from the evidence that water got into those tanks, and the bottom opening is so low, that I think the ingress of water into the tank would be sufficiently rapid to prevent their flotation. That is based on evidence given in the Court as to the availability of water to get into the tank.

Q. Supposing water did not get into the tanks?

A. Well then I would have to work out the displacement of the tanks, and have to be given certain factors to give you an answer. One factor would be the weight of the tank, which I haven't definitely worked out yet; and the height of the water that came up in the hull. Speaking from my own experience, I am confident myself, without first checking it by means of a calculation, that the water could not rise sufficiently in that hull, even if it came up to the deck,—the lower deck, to float those tanks, if they are anything like the weight I imagine they are,—or were. I think the space that they displaced in water would be less in weight than the weight of the tanks, so they could not float, if that condition is true. A vessel displaces exactly its own weight in water; that is the meaning of the word, displacement.

Q. Now it has been suggested here that there was no evidence of a severe fire in the engineroom; and reference is made to the fact that the supporting beams of

the engines, and some of the floor beams, were not destroyed, but were simply charred. What is your opinion in respect to that?

A. My opinion as to whether they were badly charred or not, you mean, first?

Q. Tell us your observation as to that.

A. Well I believe that the evidence of fire is to a less extent in the bottom part of the engineroom of the Seminole than the upper part. That may be due to the fact that the fire was of greater intensity in the upper part of the boat, or due to the fact that water came into that boat fairly early after the explosion and put out the fire, so that fire did not last as long as the combustibles did higher up in the engineroom. I think it would be explained that way readily. I understood from the evidence, Mr. Matteson, in another part, that there was a severe fire in the lower part, that affected fittings and joinings. I presume if it was sufficient to affect metal fittings and joinings, that it would be just as severe in effect on the bottom in the same vicinity.

Q. Mr. Thompson there has been some suggestion that it would be impracticable to solder joints in gas feed lines, because it was suggested it would have been necessary to use a blow torch in order to disconnect the lines. What is your opinion with respect to that?

A. Well, it is not an opinion I am expressing now; it is my experience, that that has been frequently done. We have disconnected pipe lines that were soldered, by means of cutting the solder away. Solder is put on at a much lower temperature than brazing; I will admit if it were brazed joints, that you can only break the connections by destroying it. I think a brazed joint is a permanent joint, and you have to sacrifice the pipe line if you attempt to disconnect parts that have been brazed. But that has not been my experience with soldered joints.

Q. How could the solder be cut away?

A. Well, I have seen it removed frequently with pocket knives, with pliers, little sharp tools which just quietly cut away the solder without any visible damage on the fittings or pipes.

Q. It is suggested—

A. May I just explain, Mr. Matteson, that I am just speaking from my own experience. I have never known of a case where it has been attempted to make a gas tight joint with solder. Solder, as I have seen it done on pipe fittings, has been used to prevent the backing of the nut; in other words, a locking device, more than anything else.

Q. Now Mr. Thompson it has been suggested that there would be an objection to welding rivets on a tank, because this destroy a feathered edge. What is your opinion with respect to that?

A. I disagree.

Q. In your opinion would it be practical to weld rivets without any objectionable effect in that respect?

A. Most decidedly; it is done regularly.

Q. There has also been a suggestion that welding of rivets is only done for the purpose of repairing damaged rivets?

A. That is the one time when rivets are not welded; and I can explain the reason, if you would like.

Q. Will you, please.

A. The head of a rivet is showing signs of damage from corrosion; I know from my own experience, if the head of the rivet is showing corrosion, so badly as they need repair by welding, the body of the rivet is also heavily rusted or corroded; and it would be absolutely futile to repair the head of a rivet which shows signs of such corrosion; it would have the body in the same corroded state; and good practice demands that in any rivet head showing signs of corrosion, the rivet should be renewed. It would be quite easy to find corroboration for that. That is the one time that welding is not used.

Q. Now it has been suggested here that some of the electric wiring of the Seminole had been put in a conduit pipe. What in your opinion is the effect of conduit pipe with respect to protection of electric wiring?

A. The effect of conduit pipe? It protects the wire from physical damage; that is the purpose of the pipe.

Q. Is there any other effect of conduit pipe?

A. Do you mean, hazards?

Q. Yes.

A. Well I haven't installed any in a new boat, conduit pipe system, for over thirty years. About thirty years ago we discarded conduit pipe and adopted lead covered wires. We did that because the experience we had had with pipes, running through conduit pipe, was subject to great hazard; that is the hazard of condensation,—water, inside the pipe, collecting at certain places, wherever you had a dip in the pipe; thereafter attacking the insulation of the wire, and finally causing short-circuiting.

Q. Mr. Thompson—

A. We have had many fires that have been occasioned through the installation of conduit pipes, for the reasons I have stated; and it was for that reason that we in England have discarded the use of conduit pipe for some thirty years. As is usual—I would just like to make this comment in that respect, because rules or regulations or standards, that have frequently been mentioned in this Court,—I just want to give you my opinion of those generally. It has been my experience that rules and regulations do not precede and cause good practice, but the reverse is true; that they follow good practice. That frequently a thing is done as a matter of good practice, very many years before that has been the subject of a rule, or any law. And we discarded conduit pipes very many years before they were prohibited in certain—at least in certain parts of a ship; one such spot being the engine-room, or a pump chamber, or any compartment where

highly volatile, or even fuel oil, which is not highly volatile, is carried or used.

Q. Mr. Thompson I think you called my attention to an error in the testimony that you gave when you were first on the stand, that you wanted to correct; what was that?

A. Well, the end of the March session I went through to try to find out actually what Mr. Underwood wanted of me, and I noted in glancing through the evidence that, through possibly even a mistake of my own,—I am not blaming the reporter, but there was an error in one respect, that I would like to remove.

Q. What is that?

A. Apparently I stated, or it was taken down that I stated, that I had a financial interest in C. & H. Crichton; that is one member of what I call the Crichton group. I think I had an interest in most other companies of the group, but I had no interest in C. & H. Crichton, other than that I was the consulting naval architect, and all questions that came up in connection with ship repairs. They were entirely ship repairers, they were not ship builders, that particular section of the Crichton interests.

Mr. Matteson:

That is all.

Cross Examination.

By Mr. Botts:

Q. Mr. Thompson, referring to your experience and knowledge in respect to matters concerning which you have testified, as fitting yourself for your work, this embraced the study of recognized authorities as well as your own individual experience; in other words, have you studied text books and other authorities as well as using your own experience?

A. Oh, decidedly; that has gone on continuously, because shipbuilding is a very changing profession, there is no static condition in shipbuilding, the thing changes every year, you have to keep yourself right up to date, otherwise in a few years you will probably be a back number—for many things, that is. You have to keep yourself right up to date.

Q. Then your testimony has embodied the knowledge from your own experience, and also the knowledge gained by studying authorities which embodied the experience of others; is that correct?

A. Yes, I have regularly had delivered to me the proceedings of the various institutes to which I belong.

Q. Now then have you applied this knowledge, observations, study and experience, to the construction of tanks in vessels such as the Seminole?

A. Well, I would like to make that quite clear; Shipbuilders, as a rule do not build tanks. We generally get those from specialists, because we find that a tank maker will make a tank much cheaper than we can in the shipyards. And generally, unless certain requirements are asked of us, and then the tank maker will probably have copies of those requirements,—we leave the design of the tanks to the tank maker, just specifying the requirements we have. So I have to modify it in that respect.

Q. All right; well has your study been applied to the I will put it, the construction, the life, the preservation, and safety of tanks in vessels?

A. If you will just eliminate the first part of your question, I should say definitely yes. We have constructed tanks of course in shipyards, but normally the procedure is to order the tanks outside. And I think your first question was as to the construction; but as to the life-time, the durability, of a tank, and its repair,—definitely yes.

Q. Now then I will ask you this; after a tank has been constructed, if it is riveted, that is when the caulking operation occurs, is it not?

A. Oh, decidedly.

Q. And does the caulking of a tank in any way affect the strength of the tank? I mean, its structural strength, —not its ability to hold a liquid, but its structural strength?

A. On the whole, no. It may have. Your question is put to me so I must answer it fully. Imperfect caulking may weaken a tank.

Q. Then the purpose of caulking is to add to its tightness, and not to its structural strength; is that correct?

A. Absolutely.

Q. Now let me ask you this; where two metals, such as the walls or bottom of a tank, where it is seamed, if a rust coat should occur at that point of jointure, might that rust coat create a temporary condition of tightness?

A. I am sorry, I haven't got your question quite right; may I just paraphrase it?

Q. Yes.

A. Do you wish to know whether the presence of rust between two metals—is that right?—In a seam?

Q. Yes.

A. Would have the effect of causing a temporary tightness?

Q. Umh hmh.

A. I say, yes; but I think I have already answered that question; because I have told you of a trick that they use in new tanks, to get at that very—

Q. But I want to elaborate on that very thing just a little. Does that very fact have any bearing upon the necessity of thoroughly cleaning a tank of rust before a test of its tightness should properly be made?

A. Yes; but then of course we can't clean out the rust that is in between the seams, you understand; but

for the rest of the rust, yes. Once a seam is put together, we have no means of getting at that condition, we have to leave that, that is gone. That is why it is so absolutely essential that we shall provide some means of securing that joint by means of welding or caulking. Because steel, as I have said, does not rust evenly, all over; and if you get that unevenness, opposite, in plates, you might get a cavity occurring there, which we can't get at, and then we have to depend on keeping that tank tight by seeing that the rivets are kept tight by caulking or welding, if they show—that is in a tank that hasn't been already caulked in its rivets; because we don't normally caulk or weld rivets for water tightness.

Q. Now then this caulking operation, it fills up the seam from the outside, and not from the inside, is that correct, normally?

A. Well if it is outside caulking; but the reverse is true if it is inside caulking.

Q. Well if a tank was completely built like the tanks of the Seminole, with no manhole in them, it would be impossible to caulk the inside seams, wouldn't it?

A. Oh, that is quite true; but your question was general, and I had to reply to it.

Q. Suppose in a tank built in the same general manner as those of the Seminole, the rivets themselves did not draw the metal together to an absolute condition of tightness so that a certain amount of liquid would seep in between the metal, at the lap, and the liquid was prevented from leaking out of the tank, either by caulking or soldering; would the presence of that little opening, allowing a degree of seepage between the plates, have any tendency to cause a rusting at that point?

A. Probably. Of course I haven't looked inside of a seam in the Seminole tank.

Q. I am not talking about the particular Seminole, but a tank that was constructed that way, where there was

enough aperture between two sides of the plates, to allow liquids to run in there, it would start a rust, wouldn't it?

A. Yes. Perhaps I could clarify that position for you in an answer. From my own experience in repair of tanks and steel structures, we have observed that the surface of the two plates at the lap, have been corroded—unduly corroded in places, due to the fact a leak had occurred there. We frequently get that, for instance, in steam boilers. We get the—sometimes if the leak is not discovered and dealt with, we find that, particularly in the days before welding came into general operation, we frequently had to discard the end plate of a boiler, for that very fact; that we could no longer even by picking it out and doing what we would with it, or by local repair, we could no longer guarantee that to be a tight joint. And that plate then, perhaps costing hundreds and hundreds of dollars, in some big boilers, would, due to the amount of work on it, stay bolts, and drilled holes for rivets,—would actually have to be discarded. And that little local damage has resulted sometimes in almost the destruction of a boiler, if it attacks the circumferential seam of the boiler and the seam of the end plate. So we get a major damage from a minor fault, in other words.—Is that what you want?

Q. I think so. That was caused by the seepage of the liquid in between the plates, and rusting followed?

A. Caused by depreciation of the thickness of the metal at the point of the leak.

Q. Now suppose there should be a rusting condition initiated at a point of the leakage, that way, will the rusting ever stop of its own force? I mean, if it starts to rust will it, when there has been a coating of rust, will that stop the continued rusting, or will it continue its inroad into the metal?

A. If it did what you say it would do, the very best thing we could do to the ship boilers would be never to

scale them, just leave the rust there. But in my experience, all surveyors I have ever come across, and for my own requirements, we demand the removal by scaling and wire brushing, of all the scale whatsoever, or by sand-blasting, before we apply the new paint.

Q. You heard it suggested by one witness, in evidence, that a coat of rust was a protective measure to steel metal,—or words to that effect, as I understood it:

A. Well in that case it would be better to leave all your iron windows in Miami, unpainted, leave the rust on, and just let them go with the rust, they are better protected; or, just paint on top of the rust. Ask any builder here, or repairer here, if it is good practice to paint on top of rusted window frames before removing the rust.

Q. But did you hear the suggestion here?

A. I heard it suggested, but I thoroughly disagree.

Q. Now then is the fact, such as you stated; that rust is a continuing process and once initiated continues its inroads until a dangerous condition has been established,—is that the reason why periodic inspections, cleaning and testing of fuel tanks, is necessary?

A. Yes, and the protection of the surfaces after those influences have been removed. My experience in connection with rust,—perhaps to save the record, is this: that mild steel plates, when they rust, are in a very dangerous condition; if you leave that rust on, the rate of corrosion does not go on at the initial rate, it increases,—and I think I have authorities for that. But that is my experience, without authorities; I am not speaking from authorities, just speaking from my own experience. It is vital in the life of a steel ship, or a tank, to look after the conditions of that plate, all through its history. Carelessness in the early stages will bring very rapid depreciation in the value and in the life of that ship.

Q. Well now take the case of the Fortuna, whose tanks are rotted or rusted clear through in a space of approxi-

mately fifteen years. Do you know of any condition with respect to the Fortuna, from the evidence you have heard of it, that would have prevented similar forces or corrosion applying to the tanks of the Seminole?

A. I don't know that I got that question right. Do you wish to say, that the conditions that have been given in evidence as to the Fortuna's tanks—?

Q. Yes, sir?

A. Those conditions of course would apply to the same conditions.

Q. Would the fact that the Fortuna's tanks were fitted with inspection manholes, if those manholes were used, would that have been an added element of safety in the Fortuna, that did not exist in the Seminole?

A. Provided that in addition, not only the manholes were used, but that people cleaned the tanks; you didn't put that condition.

Q. All right.

A. With that addition, yes, definitely.

Q. Then you know of no reason why, if a water film is a protection to metal, it would not have protected the tanks of the Fortuna? I say, you know of no such?

A. No, I don't know of any.

Mr. Botts:

I haven't a copy of the testimony, if the Court please, and I would like to ask as a matter of information whether or not, in Mr. Munroe's testimony with reference to applying his jumping test on this tank, he stated his weight, and the height that he jumped; if he didn't, I would like—

(By the Witness):

A. No, he didn't; I can remember that.

Mr. Botts:

I would like to ask him those questions, if there is no objection to interrupting at this time to do that.

Mr. Underwood:

What do you say?

Mr. Munroe:

One hundred seventy pounds.

Mr. Botts:

How high did you jump?

Mr. Munroe:

That I really can't say.

Mr. Botts:

Well, approximately; a foot?

Mr. Munroe:

Oh, a foot to eighteen inches, but it was a kick, not a jump.

Mr. Botts:

You just kicked, with one foot?

Mr. Munroe:

I kicked with both feet; I jumped and kicked when I came down; I kicked; so you got more force than just my weight of one hundred and seventy pounds.

Mr. Botts:

Well, we will see about that.

(By Mr. Botts):

Q. Now then Mr. Thompson, I wonder if you could compute the surface area approximately of one of these tanks of the Seminole?

A. Mr. Munroe's handbook will give that.

Q. Inside area.

A. Instead of computing it, the number of square inches, the area of a circle in square inches of approximately 42 inches, is that right?

Q. Well you have got a cylinder, you have got the walls and the end.

Mr. Underwood:

Go ahead.

Mr. Botts:

I am just waiting to get that.

Mr. Underwood:

Mr. Munroe is not on the stand, Mr. Thompson is on the stand.

The Witness:

If you will let me have the book, it will be more accurate from the book.

Mr. Underwood:

I have no objection to your using the book, but Mr. Munroe is not on the stand now.

Mr. Botts:

I thought he was looking it up for Mr. Thompson.

Mr. Underwood:


He may look it up for me, probably.

(By Mr. Botts):

Q. Use a cylinder 42 inches in diameter and seven feet high.

A. You can get it accurately from this book. Here is your circle, page 1725, here it is. 42 inches, isn't it?

Q. 42 inches, yes.



A. 42, area would be,—it gives it here as 1385 and some decimals; that will be good enough, 1385 square inches.

Q. 42 inches in diameter?

A. It gives you an area of 1385 square inches.

Q. 13855 isn't it?

A. No, not according to this book, no. 42, gives you an area of 1385 that is what it says here; the decimal place is beyond.

Mr. Underwood:

One thousand three hundred eighty-five.

Q. Is that the area of that circle?

A. Yes.

Q. All right, but that is just the area of one end; now I wanted two ends and the side; to get the entire area of the surface of the inside of that cylinder.

A. Well multiply that area—then I have to get the circumference now.

Q. All right.

Mr. Matteson:

That is on the same plate?

A. You want to add all these together?

Q. Yes.

A. I had better put this down, otherwise I can't carry these numbers in my mind. Each end would have an area of 1385, approximately, square inches, so I have 1385 twice. Now the circumference also given here; you don't want the decimal place, do you? It is 131.9, which I count 132.

Q. All right.

A. 132; and the length of the tank?

Q. Seven feet was the figure.

A. 84 inches. You want it all in square inches?

Q. Yes.

A. I add 2770 to 11088.

Q. And it gives you what, as the total?

A. Gives me a total of 13858 square inches.

Q. Well I am three inches off somewhere.

A. I didn't take decimal points. I think that is correct, though.

Q. All right; well I had 13855, so I guess you are pretty close. Now if a man weighing one hundred seventy pounds came down from a foot height on top of that tank, how many foot pounds of energy would thereby be applied to the top of that tank?

A. Multiply the weight by the distance traveled.

Q. And how much would that be? One hundred seventy foot pounds?

A. No; eighteen inches, I think he said.

Q. All right, make it eighteen inches; he said, a foot to eighteen inches. I said, if he jumped down a foot.

A. 175 foot pounds.

Q. And he weighed one hundred seventy, which would be one hundred and seventy foot pounds. Can you give us approximately how much added pressure—assuming these one hundred seventy foot pounds were distributed evenly over the inside of the tank, would be applied to each square inch of the surface of that tank?

A. I don't know what you wanted the area of the sides for, in that calculation.

Q. Because there is a pressure equally on the sides, top and bottom.

A. It is a little over, but that doesn't have anything to do with it, this calculation is not wanted. All you have to take into account is the area of the surface the pressure is applied to.

Q. Well that is the entire inside surface of the tank; isn't it?

A. The effect of that pressure is applied to it, but I assume that you just apply the same as you apply the

hydraulic ram, you put a thousand pounds on one side, you deliver a thousand pounds on the other.

Q. All right, if you distribute one hundred seventy foot pounds over 13858 square inches?

A. No, sir; I think you are going to land me out on the end of a limb, Mr. Botts.

Q. Then I just ask you to make the computation for me.

A. I just want to give the thing simply. In my opinion, you have 1385 square inches on the top; you apply a pressure of 175 pounds, that is distributed over the whole of the top area; and I don't know what that means.

Q. Well you are not getting at what I want. I can make the computation myself.

A. Yes, I think you are going to land me on the end of a limb, I don't want to be landed there Mr. Botts.

Q. You have the figures in there, and the computation is a simple matter; I have made it, and can make it in my argument. Now then with this concave bottom of the tank coming up in that manner, there would be something in the nature of a trussing effect in there, wouldn't there, that would make that much stronger and much more resistant to being pressed out of shape, than it would if it had been a perfectly flat surface, would it not?

A. Ch, yes.

Q. Now then assuming that a pressure of approximately 40 or 50 pounds per square inch were applied to the inside of a tank such as the tank of the Seminole, and it caused a permanent bulging downward of that plate, what deduction if any could you draw with reference to the condition of that plate?

A. Well why did you put the order of the pressure? Did you say, any pressure that bulged it down?

Q. Yes.

A. The same thing applies irrespective of pressure: I think in that question we would really be clearer by

leaving the pressure out, and saying, any pressure that caused a deformation; otherwise you would be getting me to have to calculate what that bottom should have stood up to, in normal good condition; and I am not giving evidence on that at all. I have never attacked the strength of these tanks in their original condition; I consider that they were amply strong enough, I have said that all through. Replying briefly to your question you now put, as to what is my opinion as to the condition of the bottom of that tank with the permanent deformation,—and may I add that the top one was not permanently deformed where extra pressure was applied?

Q. Yes.

A. That makes a very simple question, you see. My opinion definitely is that the bottom of that tank was very heavily corroded, and it lost a considerable proportion of its original strength, by reduction of the sectional area of the metal, in the way at least of the deformed area. Is that what you wanted Mr. Botts?

Q. Yes, I think so.

A. I think I had already given that answer before,

Mr. Botts.

Q. Now will you explain for the record, what is the purpose of putting a union in a pipe? What is the purpose of putting a union in a pipe line where there are other threaded joints?

A. I thought the name was self-explanatory; joining up two pipes together I assume.

Q. But isn't it to join the two pipes together without having to disturb the threads on either side? In other words, if you have a straight nipple joint, and you tighten one thread, you would loosen the next one, wouldn't you?

A. I don't follow your question.

Q. Referring to Exhibit 2; if the union was tight, if you turned this nipple it would loosen the threads on one

side and tighten it on the other, wouldn't it? And if you have a continuous pipe line and want to bring it together without disturbing these threads, it can only be done by a union, isn't that true?

A. No, sir, you can put flanges.

Q. All right, union or flanges, then, is that true?

A. Well on the whole, yes; but—

Q. Now then this valve, Exhibit 11, do I understand that in your opinion, where the threads are loose, enough so as to allow a motion in the threads, that they would not be gas tight,—gasoline tight?

A. That is my opinion. I think I have expressed that.

Mr. Underwood:

May I have the question and answer read?

(The last question and answer were read by the reporter.)

Q. And it is further your opinion, as I understand it, that there would not be a gas tight joint between the end of the nipple and the end of valve 150?

Mr. Underwood:

Just a minute, I object to that, on the ground that it is leading.

A. I think I have already answered that question, in any case. Mr. Botts, I don't think I can add to what I have already said.

Mr. Botts:

The rule with reference to leading questions does not usually apply to experts, as I understand it.

The Court:

I have forgotten the rule adopted as to your examination, anyway; aren't you on both sides of this case?

Mr. Underwood:

No, he is on the other side of this case.

Mr. Botts:

I am on the other side from Mr. Underwood; I am adverse to Mr. Underwood. In some respects I am theoretically adverse to Mr. Matteson, also. But I think, in the examination of an expert, my understanding is that that is one place in which the rule as to leading questions is relaxed; normally you ask leading questions.

Mr. Underwood:

Mr. Matteson didn't lead him.

Mr. Botts:

Not ordinarily.

The Court:

Well, we have settled that now; you are examining him as your witness?

Mr. Botts:

Well, I am examining him, not as an unfriendly witness; I am adopting,—as far as my case is concerned, I will adopt his testimony as mine.

The Court:

I think this is purely unnecessary here; he has really stated that he has answered that question before; so we will just go on, I won't make a ruling on that.

The Witness:

I think that is the case, your Honor; I think I did answer that fully before.

The Court:

I think, in addition to that he said he had answered it before, and answered that question too.

Mr. Botts:

I didn't understand him to answer it this time.

(The last answer of the witness, with the question, was read by the reporter.)

The Court:

Strictly speaking, that is leading; I will sustain the objection.

Q. Considering the loose threads and the end of the valve and the end of the union, would in your opinion there be a gas tight joint there?

A. No, sir.

Q. And assuming that the valve 125 was closed, that being the one at the end; and valve 150 was open, with a head of gasoline coming down through there, and the two valves were in line, that is, so that the wheels were, —what is this in here?

A. That is part of the valve, stuffing box; it contains the stuffing box.

Q. The wheel and the stuffing boxes were in line, so that the wheels were in line; would in your judgment there be a gasoline leak at the point where the valve 150 comes, against the end of the union?

A. In their present state, in my opinion there would be.

Q. Now this question of electrolysis in the hull of a steel vessel, has been mentioned. Will you please tell us from your experience, what is the cause of such electrolysis operating on the metal parts of a steel vessel?

A. Well it may be at least one of two causes; from stray currents acting on similar materials; it is more prevalent where you have a ferrous metal and a non-ferrous metal together, with stray currents. But I have seen of course electrolysis, or what I considered to be the effect of electrolysis, where apparently there should be no stray

currents. In my opinion it will act, with the salt water, and a ferrous and a non-ferrous metal, but not to the same extent. Electrolysis has grown with the growth of the use of electricity on ships; that we know as a definitely established fact. But in the early days when there was a lot less electrical current on a boat, electrolysis was nothing like so prevalent. I don't say it was not present, but the effect of it—we didn't observe it to anything like the extent we do in modern days.

Q. Now these plates that are used to eliminate or retard electrolysis, those are zinc plates?

A. Well I don't like the phrase, eliminating electrolysis by the use of zinc plates.

Q. Well neutralize it, then.

A. No, not even that. We in shipbuilding consider they absorb the effect of electrolysis; I think that is the—I am not a chemist and I am not an electrician; I am just stating what I believe the fact, that they absorb electrolysis, rather than eliminate it. We have what we call eliminators, but I think it is a misnomer.

Q. At any rate, the installation of these zinc plates will obviate the ill-effect on the essential parts of the vessel, of this electrolysis; is that true?

A. I prefer to use the word, minimize.

Q. Where there is not adequate protection to minimize, as far as possible, then, electrolysis. To what extent may or have you known this electrolysis to affect metal parts of a ship or its fittings?

A. To what extent; when you attach a zinc plate to a ship, it immediately becomes a metallic part of the ship.

Q. Just read the question.

(The last question was read by the reporter.)

A. You see now, you must eliminate first the—if you eliminate the zinc plates—you want me to eliminate the zinc plates?

Q. Where there has not been proper protection whatever it may be, give us illustrations of the ill-effect of the electrolysis which you have observed.

A. Oh, that without the provision of zinc plates, first? Oh, I have seen very severe pitting and corrosion on steel and other metals. I have seen the complete destruction of a heavy yellow metal seacock within three weeks of its installation, and with the effect that the seacock fractured and caused the sinking of a boat. In that particular case it was a yacht that comes down here every winter; she belongs to the consulting engineer of the City of New York; I can't just recall her name, but perhaps I can later. In that particular case where the seacock, from a W. C. discharge, was completely eaten through and fractured, I took every pains to find out, through an electrician,—called an electrician, because the tracing of stray currents is not part of my duty; I called an electrician, and we found immediately adjacent to that fitting, not an ordinary stray current, we found a heavy loss, electrical loss. We made good the wiring at that particular spot, and we have had no trouble with that particular fitting, since. I have surveyed her as recently as last winter; and this earlier occasion referred to, took place about three years ago.

Q. Have you ever observed any particular instance of the bad effect of electrolysis on, for instance, castiron portions of an engine or boiler or anything of that kind?

A. Yes, on castiron, inside and out; on castiron propellers, for instance; and I have noticed particularly the effect of electrolysis on the liners of the water boxes of Diesel engines, constantly noticing that; and at the present moment I have instructions from Underwriters as a whole, to survey all available—

Mr. Underwood:

I object to that.

Mr. Botts:

Tell us what you have observed?

A. I have observed not the complete wastage, but the turning of castiron liners from a solid iron mass into a spongy mass, with the result being that I could cut the final mass with a pocket knife.

Q. In other words, it had been originally castiron, and it became deteriorated so that you could cut it with a pocket knife?

A. Yes, and I had previously noticed that in some engineering in connection with electrolysis in boilers.

Q. Now then—

A. That is castiron, but the boilers would be wrought iron or steel, not castiron.

Q. Would it have the same effect on wrought iron or steel?

A. I don't know about that, the same effect; it would have a similar effect—somewhat similar, that is.

Q. Assuming Mr. Thompson that the electric system of a vessel such as the Seminole is in good shape and well insulated to prevent current leakage, what number of five-pound zinc plates would ordinarily good practice require, in order to minimize electrolysis as far as possible?

Mr. Underwood:

I object to that on the same grounds that I objected to similar testimony before.

Mr. Botts:

But this is an entirely different question, if the Court please. I am asking him, not how many were put there. I am asking how many would good practice require on a vessel of this kind.

The Court:

In order to answer that, Captain Thompson, wouldn't you have to know the amount of electrolysis that was present, that you were seeking to counteract?

Mr. Botts:

I am asking him to assume that the electric system was in good shape, and leakage minimized as far as possible.

The Witness:

I think, your Honor, that Mr. Botts has not put up the question in the form that I could give a reasonable answer, or an intelligent answer. That is no reflection on Mr. Botts, because he is not a shipbuilder. I don't wish to suggest the form of question, but if his question meant in effect, what would a boat of the size of the Seminole, steel construction, with the normal amount of electrical current on that boat, in normal good condition,—a hypothetical case; not the Seminole at all; what would be the number of plates normally used,—I think I could answer that question.

(By Mr. Botts):

Q. That was exactly the question I asked you Mr. Thompson; I didn't say, the Seminole, I said, a boat such as the Seminole. The question you propounded was exactly the question I asked.

A. I am sorry, I misinterpreted your question.

The Court:

Now read the question again.

(The question objected to was read by the reporter.)

Mr. Botts:

My interpretation is, it calls for exactly the same answer that was propounded in the question suggested by you, and that is what I want.

The Court:

I don't think the objection that is made there, Mr. Underwood, is applicable to this,—the objection heretofore

made. I understand your general objection, and the Court ruled that the witness could—assuming that there was something wrong, that he could give the theoretical situation that might arise, and let the Court draw a deduction as to what was wrong, if there was something wrong. The question assumed that there was something wrong, and then goes into the theory. This question, as I understand, is dissimilar to the one to which that former objection was made. I think this question calls for an answer, that the witness should respond. I shall overrule the objection.

(By Mr. Botts):

Q. All right, Mr. Thompson, can you answer?

A. I would like to make certain reservations in replying, your Honor. I can answer that, sir, but with certain reservations.

The Court:

You can explain, and make the reservations.

A. It should be noted I have not seen the underwater body of the Seminole.

Q. I am not speaking of the Seminole, I am speaking of a vessel of that size and condition.

A. Well she would have one on the rudder; two—one or two on each boss of the—I don't know what the construction is like; at least two adjacent—one or two adjacent to each propeller. One adjacent to each outboard end of the shaft. That from my experience has been a normal number—at least that size. Some people, where they have noted any action on the plate, would put them in the way of non-ferrous discharge valves, or inlet valves; and I have occasionally seen them—not frequently; I say on the whole, anywhere in number—the number I would expect on a boat of that size would be

approximately in the neighborhood of a dozen. That I think is as good a reply as I think I can make.

(At 12:37 o'clock P. M., hearing was recessed until two o'clock P. M. of the same day.)

Afternoon Session.

2:04 o'clock P. M., Monday, November 20, 1939.

Hearing was reconvened pursuant to the Noon recess; the witness JOHN A. THOMPSON thereupon resumed the witness stand and further testified as follows upon continued

Cross Examination.

By Mr. Botts:

Q. In order to pick up the contest, would you just read the last question and answer?

(The last question and answer were read by the reporter.)

Q. If the electric system of a vessel, steel hull vessel, is defective, so there are leaks of electric current, will you tell us whether or not that increases the electrolysis?

A. In my opinion, it does.

Q. In such a case, to minimize the electrolysis, more plates would be required,—more zinc plates?

A. More plates would be required, in my opinion, to absorb the effect of electrolysis.

Q. Now then taking—do you know whether it is possible, in a steel vessel equipped with electricity, whether it is possible to entirely eliminate the forces or effect of electrolysis?

A. I couldn't say. Entirely, would be rather a big statement for me to agree to.

Q. Now then in a vessel—

A. Because there is electrolysis, in my opinion, apart from loose electric currents; the action between different metals, you see. As I said before, I have observed electrolysis where there has been practically no electrical equipment. I have known of yachts that the owners have eliminated electric lighting and have been content with even candle lamps, and have told me that was for that purpose. I still think you get electrolysis on a steamer if she has no electric current.

Q. Now then in a vessel such as the Seminole, with her tanks located in a manner similar to what you observed on the Seminole, in your opinion would the forces of electrolysis operate upon the tanks to cause a deterioration in the metal of the tanks,—or gasoline tanks?

A. It may do it. It depends upon whether there are any stray currents in the vicinity.

Q. Now then you have referred in your testimony to thirty or more cases of explosions on vessels, in which you have been concerned, or which you know about.

A. Well I think that the number would vary. I said thirty; it would vary between thirty and fifty, during the last six years Mr. Botts. It wouldn't be more than fifty and I don't think it would be less than thirty; the exact number I couldn't state.

Q. Now then with reference to these vessels, did you make examinations for the purpose of attempting to determine the origin of the explosion,—the cause of it?

A. In some cases that was the sole purpose, because other surveyors had been on the job in regard to the repair, before I went on the job. In other cases I would probably be on for the repairs, and endeavoring to find the cause.

Q. You made the statement in effect that in your judgment the force of convection would be negligible in free-

ing the hold of a vessel from heavy gases, or from the heavier portions of gasoline fumes. Now will you explain that in a little more detail please?

A. Would you mind reading the question, Mr. Bryant?

(The question was read by the reporter.)

A. Well that was a general statement: I don't think any factors were put up, and I don't know that I can add very much to that, Mr. Botts. I can't think, for the moment, of anything I could add that would help you. Perhaps you could—

Q. To call your attention to what I am referring to, you stated, as near as I can recall, that the forces of convection might operate to cause the lighter fractions of the gasoline fumes to rise and become mixed with the air and become an explosive mixture. Now will you explain why, under normal circumstances, the forces of convection would not affect the heavier gases? Can you do that?

A. I don't think they are strong enough to remove heavier gases, like gasoline vapors, that are so much heavier than air.

Q. Would the normal ranges of temperatures expand the heavier gases sufficiently to cause them to rise and free themselves from the hold of a vessel?

A. No, because you have that expansion in the air at the same time.

Q. Now you have made the statement also that gases, referring to gasoline fumes, without the forces of convection, would remain in a non-explosive range. Will you please explain just exactly what you mean by that statement?

A. Well perhaps I might put it this way. This may answer your question, for the record. But in my opinion, the absence of ventilation, from exterior forces, would

make the vessel safer than where you had indifferent or inefficient ventilation. By indifferent or inefficient, I mean, not sufficient to remove the gases out of the space, but sufficient to disturb them and mix with the air, at different elevations.

Q. Well now then let me see if I understand you. If the heavy gasoline fumes are not disturbed by convection or some other source, they would remain heavy, unexplosive mixture in the bottom of the container, is that true?

A. Yes, that is my opinion, definitely.

Q. And that if they were just slightly mixed they might then become explosive and more dangerous than if there was no ventilation at all; is that the point you make?

A. They have that tendency, definitely. Perhaps I might put it this way, Mr. Botts; it may help to the point you are getting at. That a person passing along through that compartment would by interaction from his body, and the gases, definitely displace that non-explosive range and probably bring sufficient gas up into the air where you got that gas mixed with a sufficient quantity of air and you have an explosive range.

Mr. Botts:

That is all.

By Mr. Underwood:

Q. Mr. Thompson, you have read over your testimony given in March?

A. Yes and no, Mr. Underwood. I glanced through it to find out what,—I hurriedly glanced through it just to find out what you were asking me for; because you remember at the March adjournment—

Q. My question calls for a yes or no answer, Mr. Thompson.

A. I say, I glanced through it; I haven't read it through carefully.

Q. Have you got any more corrections to make, than the one you have already made?

A. None that I am aware of. There may be some there; if I had read it through carefully I probably would have observed it.

Q. Do you remember my asking you at that time, which are the greater; the stresses that are vertical with the axis of a cylindrical tank, standing on its bottom, or the stresses parallel with that axis, on the one hand, or the stresses at right angles to those?

A. Yes, I think I answered you, no, and I haven't considered the point since. I have been laid up all this year and I have put no time into this case, any more than I could help. I wasn't well at the time I was here, and I have done no work this year, except as I gave to this case. I have not prepared for this case in any shape or form.

Mr. Underwood:

I move to strike out eighty percent of that as not responsive, your Honor. I think this witness might be instructed just to answer my questions and not make speeches or voluntary statements. I didn't ask him about his health; whether he had prepared his evidence.

The Court:

Well that is rather indefinite, eighty percent. I think it is true it is not responsive; I don't know that it harms anything though. I will let it remain in the record. I think we do want to get through this afternoon.

A. Yes, sir; I will do all I can, to answer yes or not.

The Court:

—Just as much as possible, on cross examination.

Q. Do you recall that at that time you told me in your opinion, perpendicular stresses were greater than the stresses at right angles to those stresses?

A. I think so, at that time; I understood that question to be whether the stresses on the bottom of a tank would be greater than the side; and the only stress I took into account then was purely gravity. I thought that was the point you wanted; I didn't know you were putting me through an intellectual test; I thought it was a practical test applied to these tanks.

Q. You didn't understand the question, is that right?

A. I did not at the time, sir, no; I thought I so stated.

Q. Well let me ask you the question now, then; which, in your opinion, is the greater, in a cylindrical tank, standing on its end; the stresses that are parallel with the axis, or the stresses at right angles to those stresses?

A. The stresses that that tank is subject to, I will say, the stresses that are parallel to, the vertical stresses; in other words, the stresses on that tank, talking about dead load.

Q. You want to qualify that answer in any way?

A. No, sir.

Q. Or, eliminate any particular kind of stress?

A. No.

Q. You say that the shearing stresses are greater in the perpendicular plane, than they are in those stresses at right angles; is that correct?

A. No, sir, I don't want to modify that, because in no case have I attacked the strength of this tank.

Q. Well let's have it understood, Mr. Thompson, I am not talking so much for the moment, about the Seminole's tanks, as I am trying to find out whether you know what you are talking about, when you talk about stresses and strength. This is a theoretical proposition, and I am trying to test your qualifications.

A. I understand.

Q. And not the Seminole tanks. So I will ask you the question again, which, in your opinion, is the greater, in cylindrical tanks, standing on end; the shearing stresses parallel with the axis, or those at right angles to those stresses?

Mr. Matteson:

If your Honor please, this is entirely theoretical, and I hope counsel and witness understand their own questions, because I am sure it doesn't mean a thing to me. It seems to me it takes in a very indefinite basis; I don't think it is anything that could possibly be helpful in this case.

Mr. Botts:

I haven't objected to the question, but I would like for counsel to explain what he means, so that maybe I could understand what the question refers to; and I am sure that I don't, now. I haven't the least conception of what he is driving at. If he could elucidate, so that I could understand it, I would appreciate it.

The Court:

I think as a theoretical proposition, the witness, Captain Thompson, seems to understand. When we have it definitely determined that he is speaking from theory, and not from anything connected with the Seminole tanks,—just purely theory; now then I think he is entitled to ask the question, if it is intelligible to the witness,—if the question is intelligible to the witness.

A. It is a question of mechanics, your Honor, that I am afraid that—I don't know if I might answer. I am afraid that I have lost a lot of what I learned as a boy, particularly those things that I haven't had occasion to use. I used to be good at cube-root, at school, and I could no more do a cube-root today than fly. There are simple fundamental things that we never use; in shipbuilding I

have had no occasion to use it, I don't retain it in my memory; but I have had a lot to retain, as a shipbuilder and engineer, and I don't retain those things, and I am not prepared,—I am prepared to admit, to save the record, I would rather say, I don't know, than to give evidence on things that I have but perhaps little knowledge, because I haven't had occasion to use them.

The Court:

Is the question intelligible to you?

A. Yes, sir I think the question is intelligible, and I prefer to say, I don't know, in the circumstances, sir; because my head is full of all sorts of questions put to me in this case, and I am not in a frame of mind now that I can go back to a question such as that. I have tried if possible, sir, to qualify as a practical shipbuilder and engineer; I have not been a specialist, I have been a general practitioner in my business. Specialists get nowhere in shipbuilding.

The Court:

I was under the impression—I don't know the answer to it, but I hold that the question, from a theoretical standpoint, is a competent one, provided it is intelligible to a person who is an expert.

A. I never use that in my business at all, sir:

(By Mr. Underwood):

Q. You mean you have never had occasion to consider which is the greater stress?

A. No, sir.

Q. In a cylindrical tank?

A. No, sir, never had occasion to use it.

Q. As I understand it you don't say merely that you do not know the formula; you say you don't know which is greater?

A. I just say that; whichever is greater, I have forgotten; I just prefer to say, I don't know; and I think that is a complete answer.

Q. Mr. Thompson I am not asking you for your preference, I am asking you now whether today, as you sit in that chair, you know the answer to the question. Will you please tell me either yes or no?

A. I think I will say, no, sir; I prefer, to say, no, in the circumstances.

Q. Would you accept as correct the formula for determining that question, as it appears in this Lancaster Iron Works catalog that you produced the other day?

A. Yes, sir, I would be perfectly prepared to accept it.

Q. Well then take your pad, and let's do a little calculating here. I will put this before you so you can see it, and I will ask you again, so it can go in the record; assume that S equals the tensile stress in pounds per square inch; P equals the working pressure in pounds per square inch; that D equals the diameter of the tank in inches, and that T equals the thickness of the tank shell in inches.

A. Yes.

Q. And with those letters meaning those things, assume that the stress at the girth seams equals $PD/4T$; and assume that P , the working pressure, is four pounds, that D equals 42 inches; and that T equals three-sixteenths of an inch; will you tell me what the stress is?

A. The stress seems to be double what it is on the girth seam, according to that formula.

Q. Then we don't need to make the calculation. The stress on the longitudinal seam—that is the vertical seam, would be twice the stress—

A. Double; that formula is one I haven't had occasion to use, sir; but I see immediately, and I estimate, according to that formula, the stress on the longitudinal seams is twice what it is on the girder. I have never had occasion to use it.

Q. I call your attention to a photograph on page 26 of this catalog, and I ask you to note that the longitudinal seam is quadruple riveted, whereas the horizontal—the girth seam is only double riveted. Do you notice that?

A. May I have that question read, please?

(The last question was read by the reporter.)

Mr. Botts:

Just a minute; I object to the question, unless the book is in evidence.

Mr. Underwood:

All right, I will withdraw the question.

A. I would like to answer that, your Honor, if I may.

Mr. Matteson:

Just a minute.

Mr. Underwood:

Question is withdrawn.

A. That is not the fact.

Q. Mr. Thompson do you know the explosive properties of kerosene?

A. I don't think I do. I am not concerned with that, as a ship builder.

Q. Ships carry kerosene don't they?

A. Oh undoubtedly; not in large quantities, generally. Kerosene, to the best of my knowledge, is delivered in five-gallon drums; it is not, as far as my knowledge goes, carried in bulk.

Q. Yachts carry sometimes considerable kerosene for cooking purposes don't they?

A. Not very frequently. The larger yachts generally have a fuel, a similar fuel to what they use in their main tanks, so they won't have two lots of fuel to carry.

Q. Isn't it a fact Mr. Thompson, that many yachts carry kerosene for cooking?

A. No; a small percentage, whether that is many or not I don't know. I don't know the number of yachts afloat; but from my experience, a very small percentage of the boats I have surveyed, carry kerosene for fuel—that is for cooking.

Q. And you don't know the explosive qualities of kerosene?

A. Well, the flash point?

Q. No, the explosive range.

A. No, sir, I don't.

Q. Have you seen any pans under the tanks of the Semipole since you have last testified Mr. Thompson?

A. I have seen no drain pans, sir. I have seen what is purported to be a pan, and I admit it is a form of steel structure, flat on the bottom, with sides coming up at right angles to the bottom, on all four sides. I do not consider them drain pans.

Q. Well you have seen some pans haven't you?

A. I have seen some pans, as I have said.

Q. Which you have not seen before; is that right?

A. I gave you the credit of not having them there before, Mr. Underwood.

Q. Will you please answer my question Mr. Thompson? Had you seen them when you testified in March?

A. No, sir, because you restricted my survey, as I said then.

Q. Well you went over that in March, perhaps we had better go over it again.

A. I gave you the credit of thinking those were foundation plates. I think if you will turn to my testimony, I saw certain plates, and at the quick glance I had; I thought they were foundation plates; because I didn't think it was conceivable that anyone would close up the last available chance of looking at tanks; that was the bottom. You

could observe them from underneath, so I thought that in fairness to you—

Q. It was in fairness to me that you said you saw no pans of any kind, is that correct?

A. In fairness to you, I considered them to be foundation plates. I think that was my evidence.

Q. You did see them, did you?

A. I saw what I considered to be foundation plates.

Q. And you saw them there before you testified in March, did you?

A. I saw those plates there, yes, sir, in that limited survey.

Q. And they were longer than the total length of space occupied by the four tanks, were they not?

A. I don't recall that now, sir; that is, from the observation made in March, I mean—no, observation made in December, I think. I think I was there during—not March, December of last year.

Q. Well did you look up from underneath and see the bottoms of the tanks?

A. No, sir.

Q. Did you look up from underneath and see the heads of the rivets on the inside of the bottom seam?

A. No, sir, I felt them. When I looked down I got a little glance, and I put my hand there; the feel of what type of bottoms those tanks had; that's all I wanted to know. I don't think, in my observation of that, I spent more than probably a quarter to half a minute.

Q. You now admit that you could not see the heads of the rivets on the inside of the bottom seams of the tanks, could you?

A. Oh I am not prepared to admit that; no, I wouldn't say that.

Q. Do you say that you could see them?

A. My recollection of last December, I don't think I could say definitely one way or the other now, at this time. I know that I felt them, and I felt the bottom of the tank.

Q. What is your recollection now; did you see those heads of those rivets, or not?

A. I couldn't say Mr. Underwood; I don't know.

Q. You don't remember that?

A. I don't remember that, today.

Q. Mr. Thompson I want to read you two questions and answers that were put to you before; well, strike that out. Is it your testimony, Mr. Thompson, that if one were to spill a quart of gasoline in the Seminole, liquid gasoline, that that would turn into a vapor and become an explosive mixture?

A. I don't quite follow that; you mean, necessarily, without any force to turn it into,—and at what stage?

Q. Is it your testimony that if you spill a quart of gasoline, liquid gasoline, in the Seminole, that it could turn into an explosive vapor?

A. Oh yes, yes.

Q. And that results in part, from the process of evaporation of the liquid gasoline, does it?

A. That results as a part?

Q. In part.

A. Oh yes, yes.

Q. And what are the explosive limits of gasoline vapor?

A. I think it varies according to the class of gasoline. I think, taking the average gasoline, the bottom range would be one and a half percent; and I have heard in Court that the top range was six percent. But what I have been informed before I came in this case, it was slightly higher than six percent, but I will admit it isn't my knowledge, I have never actually tested it; I have accepted that at ranges somewhere between one and a half and six percent.

Q. In your opinion, would a quart of gasoline in time evaporate completely?

A. Where? In what circumstances?

Q. In the Seminole.

A. In what circumstances?

Q. Any circumstances.

A. That question is susceptible to more than one answer. Will you please give me the circumstances; I will tell you what is my opinion.

Q. Well, assume that the Seminole is in storage at a place where she is under a shed, and a quart of gasoline is spilled on her floor.

A. What floor?

Q. Engineroom floor. Wooden floorboards.

A. Yes.

Q. Assume that some of it dribbles down through to the bilge in liquid form; that assuming that her two cowl ventilators are open, and that nothing else is. In your opinion, would that liquid gasoline evaporate so that, in liquid form, it would be gone?

A. No, sir. From my experience, it would not all evaporate; that some of it would condense on the bottom of the ship, and that a large proportion of the remainder would be in the form of gasoline vapor lying approximately in the lower portions of the engineroom.

Q. And what would prevent the entire quantity of liquid gasoline from evaporating?

A. Condensation in the bottom of the ship, sir.

Q. Do you know at what temperature gasoline gives off an explosive vapor?

A. Well I believe that the flash point is approximately 32, carried out in a closed cup test. But I am not a chemist. I am not prepared to give evidence as a chemist in any way whatsoever.

Q. Well if the flash point is 32, and the temperature in the engineroom and in the bilge never gets down to 32, what is going to prevent the balance of that liquid gasoline from evaporating?

A. I don't know sir; I can only speak of what I have found in vessels, from practical experience, and not from the point of view of a chemist.

Q. You mean you have found liquid gasoline in the bilge of a vessel?

A. Unquestionably, on innumerable occasions.

Q. On how many occasions?

A. Innumerable; I couldn't give you the number.

Q. You mean a very large number?

A. Yes, sir.

Q. You have said some liquid gasoline—

A. The large number, I would like to make clear, I mean at least a dozen cases; which I consider quite a large number.

Q. Innumerable equals a dozen, now on your cross examination is that it?

A. No, sir it depends upon the circumstances.

Q. Now you have said that gasoline vapor will eventually reach a point where it becomes an explosive mixture; is that correct?

A. It depends upon the condition, again. I didn't say that, I said it remains as a heavy, non-explosive mixture; at least I understood that that was my reply, I believe.

Q. You said that there are circumstances under which gasoline vapor will become an explosive mixture, is that right?

A. Undoubtedly.

Q. And what are those circumstances?

A. The circumstances are these,—which has been answered more than once; that when that gasoline vapor mixes with air, in the proportions of one and a half percent, to six.

Q. What brings that about?

A. Where?

Q. In any boat.

A. I think partly the forces referred to by Mr. Gibbs, and partly ventilation of some order; that is, exterior forces in the ship of moving air coming in.

Q. Is it fair to say, Mr. Thompson, that when gasoline first begins to evaporate, the first vapor that is formed is one hundred percent mixture of gasoline vapor?

A. I couldn't say Mr. Underwood; that is getting very near the evidence that a chemist could give you; but I want to be quite fair to you, I don't think I could answer that.

Q. Well let's put it this way; does the first vapor that comes off of a liquid gasoline, constitute a richer mixture than an explosive vapor, and gradually dilute to an explosive vapor?

A. Possibly; I couldn't say.

Q. You don't know that?

A. No, sir; I have never made any test, so it is no use to speak on what I don't know.

Q. At any rate you say that this vapor does come to the point eventually, under some circumstances, where it does constitute an explosive mixture?

A. Yes, sir.

Q. Which is ninety-four percent air and six percent gasoline, to ninety-eight and a half percent air and one and a half percent gasoline, approximately; is that right?

A. No, those are the wrong proportions entirely.

Q. Well?

A. You have given gasoline; I am talking about gasoline vapor. You mentioned gasoline, I mentioned gasoline vapor.

Q. Take my question then as intending gasoline vapor.

A. That is what I answered your questions—

Q. Is that correct?

A. Yes, sir, with gasoline vapor.

Q. What is it that stops that process of dilution at the point within the explosive range?

A. What is it stops? I am afraid I don't follow that question at all Mr. Underwood. Maybe I am dense on it.

Q. Well do you say that once gasoline vapor has reached the explosive range, it will stay there?

A. Most decidedly not.

Q. Will it continue to dissipate perhaps under some circumstances?

A. Some circumstances, it will get more diluted, in other circumstances it will just drop down again by specific gravity.

Q. And that depends on a great many things does it Mr. Thompson?

A. Yes, sir; and where we don't know all the factors, I don't think one can give an opinion.

Q. Well temperature is one, I take it?

A. Yes temperature is one.

Q. And the amount of outside ventilation is another?

A. The efficacy of the out side ventilation is undoubtedly another.

Q. Well now let's assume that a quart of gasoline is spilled in the Seminole:

A. A quart?

Q. Yes a quart; and that as a result of the ventilation there it turns into a vapor and becomes an explosive mixture; that is, it reaches a point where it is within the explosive range?

A. Yes.

Q. And that none of the conditions under which that came about are changed; that is, that the temperature remains as it was during that change, and that the ventilation remains as it was during that change. Is there anything to stop the continuance of this process of dilution within the explosive range, or will the vapor continue to dilute until it is gone?

A. Lots of conditions there; I don't know. Is this a hypothetical question Mr. Underwood?

Q. You may have it read, if you like.

A. Will you please; I can't follow it.

(The complete question was read by the reporter.)

A. The question isn't clear, Mr. Underwood. May I shorten it by paraphrase,—what I think I am asked to answer?

Q. You make your answer in your own way.

A. You are asking me whether through various things, that I don't know what the particulars are, but through certain forces gasoline rises until it becomes—keeps rising until it becomes an explosive range.

Q. No I haven't asked you whether it rose or fell. I am just asking you to assume that a quart of gasoline, spilled in the engineroom of the Seminole, due to conditions of temperature and ventilation, is reduced to the point where the vapor from it is an explosive vapor; then I asked you, what is there to stop the process of dilution of vapor at that point.

A. Is that what I have referred to as the lighter gas, one lighter and the other heavier?—Or the whole thing? I think a continuation of that process, you may dissipate certain of the lighter gasoline mixture, provided that the means used were suitable and efficient. I don't think I can go any farther than that.

Q. Of course it won't explode until it reaches the proportions that you have given, approximately, will it?

A. Well I would rather put it,—until it reaches the explosive range. The things I have given may not be quite correct.

Q. And that explosive range is approximately correct is it?

A. I understand so sir.

Q. So assuming now that we will say six and a half percent is the maximum vapor in an explosive condition,—and I rely on the book for that—no, I am wrong about that. I think it is six percent; the upper limit of the explosive range. It won't explode until there is a mixture of ninety-four percent air and six percent gasoline; is that right?

A. I think that is the upper range. It will explode on the lower range; surely that is not right.

Q. We start with the point where the gasoline vapor as it comes off the gasoline, is more than an explosive mixture; it is too rich to explode?

A. No, that is more than—something more than six percent of gasoline vapor, yes.

Q. And by a process which I have chosen to use the word, dilution, to represent that, gasoline vapor reaches the point where it is six percent and the balance is air, ninety-four percent; it has to reach at least that point before it explodes, is that correct?

A. Has to reach that point? You get at least ninety-four percent of air with the mixture, I believe that is the accepted thing.

Q. Then the explosive range goes on while the air increases in volume to ninety-eight and a half percent, and the gasoline vapor diminishes to the point where it is one and a half percent, and you are still within the explosive range, is that right?

A. I believe those are the facts, yes.

Q. And beyond that, if the air is more than ninety-eight and a half percent, and the gasoline vapor is less than one and a half percent, it won't explode; is that right?

A. I believe that is correct; yes, sir.

Q. When you start the process of dilution, you get down to the explosive range; we will assume that no spark occurs to set it off; what is there to stop that process of dissipation at any point within the explosive range?

A. I am afraid that you would have to have a chemist to answer that. I don't think I could answer that satisfactorily, because I am not speaking as a chemist.

Q. Well as a man who claims to have had considerable experience with boats, do you know the answer to that?

A. The answer is this; that I know that you do not,—you cannot get rid of gasoline vapor in the lower part of the bilge unless you assist it by ventilation. That is as far I think as I could go with gasoline vapor.

Q. Well assuming that the forces that have brought this vapor to an explosive mixture, whatever those forces may be, continue to operate; is it not a fact that the gasoline will continue to dilute beyond the explosive range,—that

is, to a point where there is less than one and a half percent vapor, and ultimately vanish?

A. It is possible yes; that is the lighter gasoline fumes.

Q. Well now Mr. Thompson you say that if you spill a quart of gasoline you get two kinds of fumes?

A. That is what I understand, from people who are experts in that.

Q. You don't know that of your own knowledge?

A. Oh I am not a chemist at all; no.

Q. That is to say, you don't know whether you get more than one kind of gasoline vapor or not, from a particular quart of gasoline?

A. No, I have accepted that particular evidence from experts—the expert, principally, of the United Carbide Corporation, in connection with inquiry made on their behalf.

Mr. Underwood:

I move to strike out what he has accepted it from. I didn't ask him where he got it or what he accepted it from.

The Court:

That would be independent testimony. I grant that.

Q. Now Mr. Thompson there is of course such a thing as a gasoline vapor in its pure state, which is nothing but gasoline vapor; isn't there?

A. Probably; I am not a chemist, I don't know.

Q. Not mixed with air at all?

A. I should imagine so,—certain conditions.

Q. And that won't explode?

A. Pure gasoline vapor I understand will not explode.

Q. Well now let's call that a one hundred percent mixture gasoline vapor. Mixture is not a proper word, but loosely let's call it one hundred percent mixture or concentration of gasoline vapor. Now you have a given volume of that:

A. Yes.

Q. Now I want you to assume that through natural ventilation; that diminishes to the point where there is ninety-five percent vapor and five percent air.

Mr. Botts:

I object until he describes what he means by natural ventilation.

Q. I don't mind doing that; anything to force any natural wind, any wind that moves as God makes it move, not induced by blowers or forced draft. You understand what I mean by natural ventilation Mr. Thompson?

A. Oh unquestionably; I suppose you mean, by the movement of the ordinary air pressures.

Q. Now will you read the question to Mr. Thompson, please?

(The question was read by the reporter.)

Q. That won't explode?

A. I understand it will not explode until it comes to six percent gasoline vapor and ninety-four percent air.

Q. Do you know how to use the slide rule Mr. Thompson?

A. I never use one.

Q. Well I am going to ask you to use this with me, but not as a slide rule.

A. All right. I have a two-foot rule if you like.

Q. Here is a slide rule, the one at the left-hand end;

A. Yes.

Q. And also with one at the right-hand end:

A. Yes.

Q. There is a hairline on this little gadget that goes up and down. Now I put it up at the right-hand end, and I will ask you to assume that that represents one hundred percent mixture of gasoline vapor. Now there are forces which can in vessels bring that down to a six percent mix-

ture of gasoline vapor; and we will let that point now represent six percent; is that right?—So that it will explode?

A. This is all hypothetical, is it?

Q. Yes. Now that can still explode if you bring it on down to the point where it is one and a half percent?

A. Yes, so I understand.

Q. Now having run the range of dissolution from one hundred percent vapor down to one and a half percent vapor, isn't it a fact that if the forces that did that, continue to operate, it will dissipate that vapor entirely, so that you will have this little gadget down in zero?

A. And you can do away with all gas in the tanks. We only have to open up a thing to natural ventilation and be free. If you want to put a hypothetical case, I want it to have a proper basis.

Q. Is your answer to my question, yes or no?

A. I say, in the case of gasoline you cannot get rid of the whole of gasoline by any form of force,—just by air; you have gasoline there, you can't get rid of it; otherwise our tanks would only have to go in and we would get free of tanks with air pressure; we have to use something to get rid of gasoline vapor.

Q. I assume from your many words in reply to my question, they are intended to include no, somewhere in the answer, is that right?

A. I don't think you put the case up fairly Mr. Underwood. I am prepared to give you as far as possible, and as far as I am able to, a fair answer to every question you put to me.

Q. You are fair, and I am not?

A. No, sir; if I have made that allegation at any time—

Q. I am going to count in this record the number of times you have admitted being fair. Was your answer to my question, a negative answer? Do you say that the forces which would dilute that gasoline from one hundred

percent vapor down to the explosive range, would stop at that point?

A. I understand—

Q. Do you or don't you, please?

A. I don't think that is the truth.

Q. All right, what is it that stops it at that point?

A. I am not a chemist and I couldn't tell you.

Q. Is that the best answer you can give?

A. It is a true answer. I can't say any more.

Mr. Underwood:

May I have your 1936 Kent?

Q. Mr. Thompson I call your attention to a statement in the 1936 edition of Kent, which was referred to two or three days ago, on page 4-61, where it says, "Air required for combustion of one pound of gasoline, 15.3 pounds". Is that your understanding?

A. I don't know, sir; I have never studied it.

Q. Would you accept that as correct?

A. I wouldn't say it was incorrect, for I don't know.

Q. Well I call your attention to a statement on the following page: "Mixtures of air and gasoline vapor containing from 1.5 to 2.5 percent of gasoline are explosive". Would you accept that as correct?

A. Yes, but I think the range continues beyond that. This does not state that is the full range; you might quite a number of figures afterwards and still be right.

Q. I read all the words in that paragraph except a reference to a technical paper, 115 U. S. Bureau of Mines, didn't I?

A. That is right, sir, but it does not say that is the range. It just says that from 1.5 to 2.5 gasoline is explosive, but it does not say that percentages beyond that are not explosive. That is all the comment I have on that.

Q. Well do you draw any distinction between the amount of air necessary for combustion, and the percentages of an explosive mixture?

A. No I don't draw any distinction; I just am pointing out that that does not give the range.

Q. Now you said something during the course of your testimony on direct examination, Mr. Thompson, about when you subjected a boiler to a hydrostatic test, it changes its shape minutely. Do I understand that correctly?

A. Yes, sir that is correct, because we make tests, we actually make tests of T-frames, and we measure the length of the boiler, the length of the furnace from the back-tube plate to the front. Those are made on all boilers of any size, regularly.

Q. Boilers of any shape?

A. Scotch boilers.

Q. Do you refer to boilers of cylindrical shape?

A. Yes, that is a Scotch boiler.

Q. The record may not show that.

A. Oh, I am sorry; cylindrical boilers of Scotch type. They are ordinary common boilers used in most steamers afloat.

Q. I don't think this involves the realm of chemistry, but of physics. What shape does any object of that sort tend to assume under internal pressure? Is it the spherical shape?

A. Oh, perhaps you have got me wrong, Mr. Underwood. What we measure is what I have already stated; the lengthening of the boiler under a hydrostatic test; and that boiler, in length, does creep, and we note the length of creep, and the length of furnace, and the length from the combustion chamber back plate to the front of the boiler. Those are the things we note; the increase in length due to pressure; no other conditions. We don't worry about the diameter or anything else.

Q. Does your knowledge of physics enable you to answer this question: what shape does any object tend to assume under pressure from within? Is it spherical?

A. Well you see, that Scotch boiler has stiffening members in.

Q. Let's do away with the stiffening members now; just take any object, take a shoebox and fill it with water; what shape does it tend to assume, do you know?

A. A shoebox?

Q. Any object.

A. It depends upon the strength. I don't know, I haven't tested it; I am only speaking from my experience, from no other point of view.

Q. Then do I understand that you don't know what shape an object tends to assume,—a closed object, under internal pressure?

A. Well I do, lead pipe is apt to go oval in shape, or spread out, an irregular thing. It depends entirely upon the article, and I have never made such tests, because I haven't had cause to make the test; I haven't studied it.

Mr. Botts:

I don't want to make the statement I do, if it is going to interfere, but are you trying to establish a fact, or are you testing this witness? Now I am willing, so far as I am concerned, to concede certain facts in that connection. If you are trying to establish facts, I don't want to interrupt you.

Mr. Underwood:

What are you willing to concede?

Mr. Botts:

I am willing to concede that any object of that kind, from internal pressure, tends to become a sphere. I know absolutely that that is the fact, that the tendency is that way, but various points of stress may prevent that from being accomplished, in many instances.

Mr. Underwood:

Well what I was trying to do,—now I will answer your question; we will both establish the fact and test the witness; but we will pass that by.

Q. As to the strength of the Seminoles' gasoline tanks, I think you have said that the heads are the strongest part; is that correct?

A. The head?

Q. I so understood your testimony; am I mistaken, or correct?

A. From my experience, I should think the top head is the strongest part, not the bottom one.

Q. Why is that?

A. Well I don't know that I can give you a reason, but I think you will find that the bottom head would only be passed for the same thickness, for about 60 percent or so of the top. I haven't much knowledge on that point, but I believe the top head is the stronger, there.

Q. Well isn't it a fact Mr. Thompson that the top head is the stronger so far as internal pressures are concerned, because it has already assumed a concave, spherical shape, viewing the tank from the inside?

A. It has assumed a strength, as far as my knowledge goes,—I have never given it any thought; just the fact it has been pressed into that shape under high pressure; I think that is right.

Q. In other words you can't change the shape of the top of that tank by internal pressure, it will crack first, won't it?

A. Quite possibly; I don't know. I couldn't say as to that. Probably would crack.

Q. Well now looking at both ends of this tank, and assuming a pressure from the inside, the bottom can change its shape without cracking, but the top is already a segment of a sphere can't; isn't that so?

A. That is possible, yes. I understood it had changed its shape.

Q. Now of course when you increase the pressure on a cylindrical object filled with a liquid, fully filled with a liquid—

A. Yes.

Q. And you increase that pressure at one point, it increases the pressure throughout, does it not?

Mr. Eotts:

May I have that question read? I just can't understand it.

(The question was read by the reporter.)

A. Oh yes; yes.

Q. And I take it you will agree with me that the pressure is the same throughout, won't you?

A. I should say, for all practical purposes, yes.

Q. Well isn't that the theory of your hydraulic ram, for example?

A. Oh yes; you transmit through the water, the pressure per square inch is identical throughout, I should say. I have never carried out that test of course, but I believe I would accept that as a correct statement.

Q. If the tank is going to give away at all then, it will give away at the weakest point, won't it?

A. I think that is right, yes; just like a chain, which breaks at the weakest link.

Q. Now Mr. Munroe, you said something on direct examination—I am sorry, Mr. Thompson; you said something on direct examination about these tanks would show evidence of corrosion after ten years. I am not quite clear from my notes just what you did say.

A. Will you please read what I did say?

Q. It hasn't been written up yet.

A. Oh, in this Court; I am sorry, I thought you were referring back to last March. I am sorry.

Q. What do you think the effect of corrosion on the bottoms of the Seminoles' tanks would cause them to look like after ten years?

A. May I have that question?

(The question was read by the reporter.)

A. That is the exterior?

Q. Interior.

A. I really couldn't say. It may vary in some parts; the corrosion may be heavier than others.

Q. Well you have been asked to assume that these tanks were installed in 1922, I believe.

A. Yes, that is my understanding.

Q. Well assume for the present purposes that nothing was done to them from that time on until 1935 when this fire occurred.

A. Yes.

Q. Do I understand from your testimony correctly that you would expect in that interval of 13 years, to find such serious evidence of rust and corrosion as would account for the buckling of the bottom when Mr. Munroe jumped on the top of it?

A. No I haven't said that.

Q. Didn't you testify that—

A. I would expect to find quite a lot of corrosion there, and I imagine that the plate is weakened considerably since the tanks were built, undoubtedly.

Q. Well assuming that the material of which those tanks were made was originally galvanized, so that the tank was galvanized on the inside; would you expect to find the galvanizing all gone?

A. No, I don't know that I would; no, not necessarily.

Q. Would you expect to find the galvanizing gone at all?

A. Oh yes I would expect to find some of the galvanizing gone; and perforated,—holes, spotty. Not an im-
previous coating, by any means.

Q. You would expect to find some of the galvanizing eaten away?

A. Possibly, I don't know. I haven't been inside of those tanks.

Q. What would you expect to find in the V-shaped angle around the bottoms of the tank?

A. I don't know. You mean, just in the space, or in the seam?

Q. In the V-shaped space in the bottom; what effect of the passage of the years, would you expect to see?

A. I would expect to see evidence of corrosion, undoubtedly. It may not be continuous, it may as I have already stated, that some parts of the steel corroded more rapidly than others. I think I have said that.

Q. Would you expect to find it pitted?

A. Quite possibly, in places; yes; definitely pitted in places. I don't say it is pitted in every particular spot, but there may be places where it is pitted, undoubtedly; other places where it may not be.

Q. Would you expect to find that the three-sixteenths inch material had been reduced in size considerably?

A. I don't know as it was three-sixteenths originally; I don't know what the original thickness was, definitely. I assumed it was three-sixteenths, but I didn't measure it.

Q. Well let's assume it was three-sixteenths; would you expect to find it reduced by rusting and corrosion or similar actions, to anything substantially less than that?

A. Possibly not.

Q. I think you said—

A. Pardon me; is that the plating at the seam, or just in the—

Q. Any place inside the tank, particularly with reference to this V. I want you to tell me what you would expect to find.

A. The dangerous corrosion I would look for would be the corrosion in the seams between the plates.

Q. Would you expect—

A. And particularly, my own impression, particularly higher up than the bottom, naturally. I would expect to get more evidence of unevenness of the surfaces in the vertical seam,—if you want me to say what I think, of the tanks. I have never stated that I thought these tanks had a big leak. What I feared all through the tanks of that description, is seepage. I think I stated that, in March.

Q. Now you said on direct examination within the last two or three days that these tanks would be subject to heavy, continuous corrosion; is that your opinion?

A. Pardon?

Q. Will you read the question please?

(The question was read by the reporter.)

A. Yes, that is what the outside of the tanks appeared to me to be in—the parts I can see; my opinion, from the upkeep of a good tank, I would consider, my own personal opinion, the exterior of those tanks to be what I said, seriously, affected by corrosion. I think they are pitted, from my observation, the outside.

Q. I think you said you would expect to find nothing left but rust, after thirty or forty years; is that correct?

A. Well it depends upon the amount of care the tanks had, Mr. Underwood. You mean, tanks corroded like that?

Q. Assuming the Seminoles' tanks were installed in 1922, nothing was done to them up to the time the fire, and you know under what conditions they have been since the fire.

A. But that is not thirty-five or forty years. I thought you gave me a period of thirty-five or forty years.

Q. That is right. Now under those circumstances, after thirty to forty years, which is my note of your testimony

on direct examination, you said you would expect to find nothing left but rust. Is that correct?

A. What I would call rust, as far as a steel plate is concerned. A plate that is not suitable for any purpose; if you cut it off the scrap,—it would be no earthly use but for scrap.

Q. Something you could put your fingers through?

A. Not necessarily. It hasn't got to go to that extent, in the opinion of a shipbuilder, to become a useless plate. There are plates in boat yards now, taken off boats, that they use them for runways; they put them on the ground, plates taken off, badly corroded, no longer fit for the purpose for which they are intended; but they are good enough for other purposes still; that is, for forming runways for carriages.

Q. Then when you said, after thirty or forty years you would expect to find nothing but rust, is that something of an exaggeration?

A. That is a shipbuilders point of view. We would call that nothing but rust; it has no earthly use, so pitted and corroded we couldn't possibly use it. I didn't mean it would go to pieces in any way.

Q. Do you think it would be rusted through under those conditions, in thirty-five or forty years?

A. Absolutely, from my experience I know that. I am not speaking about theories now, or opinions; I am speaking of what I have seen.

Q. So that between 1922 and 1939 it ought to be somewhere near halfway in that process?

A. No, sir, that is contrary to my testimony, absolutely. I said that the rusting increased not in an equal rate; that is what I intended to say, and I believe is in the testimony, I believe the rusting over the second half of that period would be must more rapid than in the first period. I believe that is in accordance with what I said.

Q. Assuming the Seminoles' tanks were installed in 1922, and never removed from this tank compartment un-

til 1935; since the time of the fire they have been in the condition which you have observed; would you expect to find the galvanizing intact, or partially destroyed, or wholly gone in the inside?

A. Well I don't know that I would expect it to be fully gone. I would expect to find what I would call, in a very porous condition, particularly in the way of the seams. And I am not questioning that the tanks were not strong enough just prior to the fire, structurally; I haven't suggested that at any time. My criticism was as to the tightness of the tank, not the durability. I believe that they would not be gas tight.

Q. Well Mr. Thompson I am not quite clear about one other aspect of your testimony. Have you expressed the opinion that Mr. Munroe's jumping or kicking on the top of the Number Four tank, did not cause the bulge in the bottom?

A. Did not?

Q. Umh hmh.

A. I didn't say anything about whether it caused it or not. I didn't think he would be able to press the top in; that is my real opinion. I couldn't conceive that jumping on top of a tank of that character would push the top in, at all; that is what I meant to imply, and I thought I had. I couldn't conceive a man jumping on top of a tank like that and compressing a pressed steel plate of that character, in. A matter of opinion; I personally don't believe the plate would move at all.

Q. Well then is it your conclusion from that that Mr. Munroe's jumping on the top did not cause the bulge in the bottom?

A. I don't know what caused the bulge, I was not there; I was not asked to come to see it.

Q. Is it your opinion that Mr. Munroe's jumping on the top did not cause it?

A. I don't know.

Q. You don't know whether it did or not?

A. My reply is, I don't know.

Q. Have you an opinion on that subject?

A. No I haven't an opinion; if I had, I would express it quite freely to you.

Q. You saw the bulge didn't you?

A. I saw the bulge yes.

Q. And did you testify in response to Mr. Botts today that that bulge could only have been caused because the inside of the bottom was very considerably eaten away by rust and corrosion?

A. Is that—would you mind reading my answer, because I don't think it was quite like that.

The Court:

Do you want your last answer read?

A. He is referring to an answer I made this morning, Judge, and I can't just recall the terms of it. If I said in substance what you said now, I think I may have to correct it.

Q. Well assuming that that is what you said, if you want to correct it, go ahead and tell me what your thought is on that point.

A. What is the question you put?

(The question referred to was read by the reporter: "And did you testify in response to Mr. Botts today that that bulge could only have been caused because the inside of the bottom was very considerably eaten away by rust and corrosion?")

A. No I am quite sure I didn't say that.

Q. Well how do you account for this bulge in the bottom?

A. I haven't attempted to; I don't know. If I had been present at the test I would have been able to say, but I don't know; I don't know anything about those tests, only

what I have heard.. I was present here when they were carried out, apparently.

Q. I am not asking so much about the test, as about the bottom.

A. It may have been there before the test took place; as far as I know. I don't know when it occurred, I couldn't say; I have had no opportunity of observing that. I only saw that bulge after the tank was taken out.

Q. According to my notes, Mr. Botts asked you to assume, first, forty to fifty pounds per square inch was applied inside the tank, and caused the permanent downward bulge; and then you suggested that you would rather not assume forty to fifty pounds, but assume some indeterminate pressure, and that that caused the downward bulge. According to my notes, you accounted for that possibility by saying that the bottom must have been very heavily corroded, to such an extent that it had lost very much of its original strength. Is that your testimony?

A. That may be; that may be some of what I said, I don't know the exact words. But I don't think that I stated that that bulge was caused by Mr. Munroe's test, because I don't know it was three—not there, before. Actually I have no knowledge it wasn't there before, so I certainly wish to correct if I said it was caused by Mr. Munroe. I don't say so.

Mr. Underwood:

Now will you read my question to the witness, please; I am sure you will find nothing whatever in that question about Mr. Munroe's tests.

(The preceding question was read by the reporter.)

A. Well even that question isn't quite clear to me, Mr. Underwood. I remember Mr. Botts asking the question, and I asked him to alter it; I remember that part. I don't

know that I went on record that I said that that was as a definite proof that there was heavy corrosion there. If I said that, I didn't mean it at the time. I don't know what corrosion was there; so many indeterminable things. These hypothetical questions are put up to me, they have all sorts of factors; and I am supposed to give definite answers on all sorts of indefinite things. I can't give answers of that description. I don't know if that bulge was there after the test or before.

Q. You understand that I have been asking you whether the bulge was there before the test?

A. No you haven't asked me whether it was there before the test. I don't know; I have previously answered I don't know when the bulge came.

Q. Then you don't need to answer that question any more, Mr. Thompson, because I haven't asked it, and I am not going to ask it. Now I will ask you that same question, as nearly as I can: assume that pressure enough,—some pressure, from the inside of this tank, was applied and had the effect of bulging the bottom:

A. Yes.

Q. Is it your opinion that in order to account for that bulge, it is necessary to assume that the tank was badly corroded?

A. No, not necessarily, by any means.

Q. Including in that assumption, of course, the fact that the balance of the tank has not been materially distorted.

A. Not necessarily; true, no. Not necessarily. I just gave you a reply to what I thought was merely a hypothetical question.

Q. Well what else can you conceive of that might have caused that bulge in the bottom?

A. What else, other than what?

Q. Other than Mr. Munroe's test.

A. I don't know. I couldn't say. I couldn't say what caused it at all.

Q. Can you think of anything else?

A. No, I can't think of anything else. I don't know what caused it, and I can think of nothing else. It may have been there originally, for all I know; it may have been there all the time. I couldn't tell you that.

Q. Have you any opinion as to whether Mr. Munroe's test could have caused it?

A. No I haven't any opinion at all in that respect. I was not present at the test, as I said.

Q. Well it is not your purpose to have us understand that Mr. Munroe's test did not cause it, is that right?

A. Not one way or the other.

Q. Now you saw the remains of some solder in the little niche around the bottom of that tank did you not?

A. Oh yes.

Q. I am not clear, Mr. Thompson, whether there is any implication in your testimony that that solder was placed there after the tanks was removed from the compartment. Do you make that suggestion?

A. Why I most certainly do not, Mr. Underwood. How dare you make such a suggestion to me? No, I don't think my evidence at any time can be interpreted in any such way. I hold Mr. Munroe in high regard; do you think I would make any such suggestion against him personally? Certainly I would not.

Q. Well of course you understand Mr. Thompson that I didn't include in my question the application of any solder by any particular individual.

A. I haven't made any suggestion at all that anybody put any there.

Q. Then you do not suggest that the solder was applied in the year 1939?

A. No, sir; and I am sorry that you thought my evidence at any point made such a suggestion.

Q. As to the occurrence of an explosion in the tank compartment Mr. Thompson you have given us, as I recall your testimony, two things on which you base your

testimony that in your opinion there was an explosion there. One is the apparent distortion of the bulkheads. You said, I think, that they were splayed open at the top?

A. Yes.

Q. And the other is that Exhibit 3-W, taken—a photograph taken on the afternoon of the fire, shows the tanks displaced?

A. That is right.

Q. Is that correct?

A. That is correct.

Q. Now you have mentioned nothing else. Have you anything else in mind that indicates an explosion in the tank compartment?

A. No I don't recall anything in addition to that.

Q. Now, do you say that the fact that the bulkheads are further apart at the top than they are at the bottom, if that be the fact, could only be caused by an explosion?

A. I have stated in my opinion that that was due to a heavy explosion.

Q. Will you listen to my question, please, and answer it this time.—Mr. Bryant will you read it to him?

(The preceding question was read by the reporter.)

A. In the circumstances I have heard, I should say, yes, that is my opinion.

Q. Of course, steel expands in heat, doesn't it?

A. Oh yes.

Q. You don't deny that there were some supports of some kind across the top of that tank compartment space before the fire, do you?

A. I don't know. All I found, I found a series of holes with some wood screws in; I don't know what they were there for.

Q. Of course there must have been something there to hold the deck?

A. I assume there was a wood piece to secure,—to screw the deck down with. That is what I assume.

Q. As a matter of fact Mr. Thompson you understand that this vessel did have a deck above that level?

A. That is what I understand.

Q. She had a pilot house and some public social quarters up there?

A. That is my understanding, yes.

Q. There must have been something there to hold them up musn't there?

A. Oh yes; a deck.

Q. Must have been members across from the upper ends of what we have spoken of as the ribs, musn't there?

A. At the sides? There were ribs on the sides.

Q. Do you remember seeing the top of any ribs in the photograph, and on the boat itself?

A. Do you mean, the top of the frames?

Q. Yes.

A. Yes, and I have seen them on the wreck too.

Q. There must have been something across from those points, to hold up the deck?

A. Yes I should think so; wood pieces across there.

Q. Of course that would exist throughout the length of the ship, at various distances, would it not?

A. Yes.

Q. What distances, we don't know, do we?

A. No, at least I don't.

Q. And is it your opinion then that the explosion is the—an explosion is the only possible way to account for what you say is the greater distance between the tops of those so-called compartment bulkheads, and the bottoms?

A. No, sir, because they may have been altered. I am speaking of what I found in the wreck, the appearance I found in the wreck. They have the appearance to me as though they had been forced there by an explosion. People might have come and pulled them apart. I don't know.

what has happened between the explosion, but I gave the facts on which I based my opinion.

Q. You didn't find any marked distortion in any particular place, did you, in the bulkheads,—tank compartment bulkheads?

A. I don't recall that.

Q. You didn't find any plates ruptured or broken open did you?

A. I don't recall any; I wouldn't expect to.

Q. You have seen explosions that caused the rupture of plates haven't you?

A. I haven't seen explosions; I have seen the results of explosions.

Q. You have seen plates that have been ruptured by explosions, haven't you,—steel plates?

A. I don't think I have, on steel vessels; at least I don't recall having seen them on any steel vessels.

Q. You looked this morning at Exhibit 3-W, and as I understand it, said that you saw on there that one or more,—I am not sure which you said, tanks, showed displacement,—showed they had been displaced. How many, and which ones?

A. I am just judging the photograph now; just purely what I am looking at. The one that seems to have the most—the two I would rather say, that seem to be displaced more than the other two, would be the two center ones, from the appearance of the photograph.

Q. And you judge that by what?

A. By the appearance that they give to me in the photograph.

Q. Well what is there about the photograph that gives that appearance to you?

A. Well to me, I am judging it, is the distance from the edge of—that is Number Two, is it not?

Q. They were numbered from port to starboard. You are looking from aft, forward.

A. That is the Number Two tank; the top of that, and the top of the next tank, Number Three, seem to show more of the top than the other two.

Q. Is there anything else about the photograph that indicates displacement?

A. I haven't noticed it up to the present; there may be. That is what I base my opinion on, at any rate, Mr. Underwood.

Q. Well now if the top of the after tank compartment bulkhead had spread or moved closer to the stern of the vessel, it would give the appearance of showing a greater proportion of the tops of Number Two and Three tanks, even if the tanks had not been displaced, wouldn't it? Isn't that necessarily so?

A. No I judge that those, in comparison with Number One and Four—I say that in comparison, not with the bulkhead, but in comparison with two other tanks in the same photograph, it seems to me that these tanks lean aft to a greater degree than Number One and Four. That is what I said Mr. Underwood; I am just looking at the photograph; you can judge as well as I can. My evidence—

Q. Well now if there was an explosion in there sufficient to cause those bulkheads to be moved in the way you have indicated, what effect would you expect to see on the wooden timbers that held the tanks together?

A. I couldn't say sir. I didn't notice anything on them at the wreck that I could—my observations in that respect are confined to what I have already given in evidence.

Q. Well now certainly there wasn't an explosion in the tank compartment of sufficient force to break the pipes which you see remaining in Exhibit 5-J, was there?

A. I can't make this photograph out; which way is this looking? What is this?

Q. You are looking practically straight down in the area between Number One tank and the port side of the vessel. This white stuff down here at the bottom of the

photograph is Number One tank. This steel material on the upper section of the photograph is the port side of the vessel; at the left is the after tank compartment bulkhead, and at the right is the forward tank compartment bulkhead.

A. Is this looking down from the top into that space?

Q. Yes.

A. And what is the question?

Q. If there was an explosion there, it wasn't severe enough to break these remaining pipes, four of them, was there?

A. To break them? They are not attached to anything.

Q. It wasn't severe enough to break those remaining sections of pipe, was it?

A. They don't seem to be broken, but they are not attached to anything though; they are just pipes stuck up, as far as I can see, that is a different thing; they are not attached to anything. If they had been broken away from something, I couldn't say. They are just free pipes. If I had looked at those pipes that wouldn't have given me any information in regard to an explosion.

Q. Now I just want to be clear about one thing. Do you say that when rivets are burned out of a steel plate by an oxy-acetylene torch, that one must necessarily discard the plate?

A. In a gasoline tank?

Q. Yes.

A. Well I certainly would. I don't know what the practice of other people is, but I am quite certain, my experience in good practice would call for that. I am not responsible for bad practice on the part of anyone else. That I say definitely, without equivocation whatsoever.

Q. I think you have testified that there was some kind of a beam at the top of the after tank compartment bulkhead; is that right?

A. I don't know; I didn't see any beam there at all. I saw holes—

Q. Didn't you express an opinion that there was a beam there?

A. I expressed an opinion that there was probably a wooden beam across there.

Q. Now how far to starboard did that beam go? Can you express an opinion about that?

A. No I couldn't say sir.

Q. Did it stop at the starboard end of the tank compartment, or did it go over to the starboard frames of the ship?

A. I couldn't say sir; I have said that; I gave that evidence, in view of what I found down in the bulkhead,—a series of holes, with certain wood screws left; and it was on what I discovered there, I gave that testimony, and on nothing else.

Q. And you are unable to express an opinion as to whether that beam, assuming there was one there, went over to the starboard side of the vessel?

A. No, sir, I couldn't give any opinion as to that. I didn't look for it, Mr. Underwood. I am not trying to escape; that is the absolute fact.

Q. Do you say that in stopping up leaks in boilers you sometimes use oatmeal or some such substance?

A. I didn't say, in boilers; I referred to tanks.

Q. Well, to tanks then.

A. No, pardon me; I didn't say I used that. Please correct that.

Q. One sometimes uses.

A. I think the evidence was—

Q. That is a trick you have to watch out for?

A. I think that was tricks.

Q. Well now, directing your mind to that for the moment, does the oatmeal seep out of the little holes and lodge there?

A. I don't know whether oatmeal seeps out. With a sufficient quantity of oatmeal it has been found—I have never actually checked or seen that condition myself; I say, that

is a trick we have to look for, because I have known it to occur. But I have never actually come across a case in my own work where that was done; because if that was found, those men would never come in my yard again. I say, that is in an answer about a commonly known trick.

Q. A somewhat similar practice is used by some engineers in stopping up condenser leaks at sea, is it not?

A. Well sir I have never heard of that; no, sir.

Q. Well how does the oatmeal, when you put it in the tank, happen to get to the place where the leak is?

A. I don't know sir; I haven't had experience. I mentioned that merely as a trick; that is one reason we go to a tank to see that no extraneous matter has been put in the tank that may possibly get into the seam and stop leaks.

Q. Isn't it a fact that the flow of the water through the hole, is what carries the oatmeal to the hole and stop it up?

A. I am talking about tanks in ships, that are caulked on the outside.

Q. You mean this situation about oatmeal does not apply to tanks that aren't caulked?

A. Pardon?

Q. This testimony of yours about oatmeal does not apply to tanks that are not caulked on the outside?

A. I have never had a test on a tank that was not caulked or welded, so I don't know anything about such test.

Q. You never had such tanks?

A. No. I have seen plenty of water tanks not caulked, but I am talking about my experience in tests. I thought you said, confine my answer to my experience in hydrostatic tests.

Q. What I want to do is to take up this oatmeal, and get you to tell me if you know just how the oatmeal gets to the point of the leak and stops it.

A. Why I have never had the experience of the trick, I have already said, and all I can give you now is just an expression of opinion as to what might happen if such

a trick were adopted. I believe the theory is, those who adopt that trick, the workmen in charge of that tank, is that the oatmeal will, in the process of the filling of the tank, some of it will get in it on the inner edge, which is not caulked, and has a crevice all the way down, and it fills up that crevice and swells. I believe that is the theory; whether it is a successful theory or not I don't know, because I have never seen it happen. I have only spoken of things I have heard of happening in other people's yards.

Q. Well isn't it necessarily a fact, Mr. Thompson, that there must be a flow of water through the crack in order to take the rivet there?

A. Yes.

Mr. Botts:

You mean, take oatmeal there?

Q. Take the oatmeal there?

A. Yes, and that is the place they want the oatmeal to go into, where the flow is; that I understand is the object of it. There is no good flowing to where there was no hole there,—didn't do any good.

Q. Now have you testified,—is it your testimony that the rivets around the bottom seams of these tanks were improperly spaced?

A. I don't think I said they were improperly spaced.

Q. I am just asking you whether they were or not, in your opinion, properly spaced.

A. I don't think I have said that in my testimony. I referred to the rivets, that they were not in alignment.

Q. Let's just talk about the spacing. Do you say that they are improperly spaced?

A. That they are not equally spaced; some centers are farther apart than others. I didn't say as to the distances between the centers of the rivets.

Q. Let's talk about that; all I want to find out is whether or not you have any opinion adverse to the spacing of those rivets, so far as the approximate distances between centers?

A. Center to center, no.

Q. You have no criticism on that?

A. No, I never made any.

Q. Will you just bear with me, Mr. Thompson, while I get one or two things straightened up. Now is it your testimony that the vent pipe from these tanks should be not less than half the size of the filler pipe?

A. I think I stated that in my opinion a satisfactory air pipe would not be less than half the area of the filler. I think that was the opinion I expressed.

Q. Well is it your opinion that the Seminole's vent pipe was too small, compared to the size of the filler pipe?

A. In my opinion it was some, yes.

Q. And is your reason for that, that it would build up a vapor pressure while the tank was being filled?

A. I didn't say it would build up; I said it would be apt to create a pressure on the seam, on the joints of the air pipe. I believe that is the purpose of having the air pipe somewhere in proportion to the diameter of the fill pipe.

Q. Is it your opinion that that comparative size of those two pipes was such that a vapor pressure would result, which might affect adversely the seams of the vent?

A. What, make them not tight? No, I say you would build up a slight pressure there; a rapid fill through a big pipe, into a big tank.

Q. A four-inch filler pipe, is that right, was it, on the Seminole?

A. Oh I don't think so.

Q. Two-inch pipe I should say; is that right?

A. I think that is right.

Q. And a half-inch vent, is that right?

A. I believe that is approximately correct.

Q. Well that is four times,—the vent pipe is one-fourth the size of the fill pipe, is that right?

A. You mean—that is right. What do you want now?

Q. Do you say that that would cause any adverse effect on the joints of the vent pipe, in filling?

A. I certainly did not. On the joints?

Q. What is your testimony?

A. I said that in the event of the joints of the air pipe not being tight, building up a pressure of any order in those tanks would be apt to cause leaks through those imperfect joints. I didn't say it would affect the joints,—have pressure enough to affect the joints.

Q. The only effect of that would be, if the joints of the vent pipe are already somewhat loose?

A. Oh yes, certainly; most decidedly. I am sorry if you thought my answer was any other way.

Q. Mr. Thompson I will ask you to assume that in the filling pipe of the Seminole there was a valve at each tank, so that the tanks could be filled individually or in any combination.

A. Yes, sir.

Q. Of course you know, or I will ask you to assume, that the feed line system contained a valve at each tank?

A. That's the outlet from the tanks, do you mean?

Q. That is right, so that gasoline could be fed from any tank individually.

A. Or any combination?

Q. Or any combination.

A. Right, sir.

Q. With that understanding, would it be impractical—impracticable, to apply a hydrostatic test to each tank individually?

A. Without disconnecting—not if you disconnect the air pipe and attach your pipe to the top of that. I think I said that.

Q. In other words, you can put a riser on the fill pipe?

A. Pardon?

Q. You can put a riser on the filler pipe on deck, is that right?

A. What are you going to do with the outlet from the air pipe?

Q. Just answer my question.

A. No, sir, it would be absolutely useless unless you have got a hole in the top of the tank, then what is the use of putting a hydrostatic test, when you have the top of the tank open?

Q. Can you put a riser on the fill pipe on deck?

A. You can put a riser on the fill pipe affecting all the tanks. You are talking about separate tanks, now. You cannot hydrostatically test those tanks individually, without removing that air pipe, because there are no valves on the air pipes. If you want to test one tank you have to test the lot and also that type of air pipe. You can't test those tanks separately without removing the air pipes; that is definite.

Mr. Underwood:

May I suggest a short recess, your Honor? I think I am getting toward the end here.

(Brief informal recess was had.)

(By Mr. Underwood):

Q. Mr. Thompson you could subject all four tanks to a hydrostatic test together, couldn't you?

A. No, sir.

Q. At the same time?

A. No, sir.

Q. Not at the same time?

A. Not at the same time—not without you remove that air pipe. If you remove that air pipe and applied—you would have to—

Q. Couldn't you just plug the vent pipe?

A. Plug the vent pipe? Then you would be subjecting the air pipes to the hydrostatic test, as well, and you wouldn't know where a leak occurred if it did occur.

Q. You could plug the vent pipe couldn't you?

A. Yes.

Q. And then put a riser in the fill pipe, couldn't you?

A. Oh yes, certainly.

Q. And then you could ascertain whether or not there was a leak between the beginning of the fill pipe and the point where the vent pipe passed through the skin of the ship; isn't that right?

A. You would not have a satisfactory hydrostatic test.

Q. Couldn't you tell that?

A. You can tell, but it wouldn't be worth two hoots.

Q. If the water in the riser didn't fall, you would know that your tanks didn't leak, isn't that a fact?

A. Provided you cleaned the tanks out first; the first essential of any hydrostatic test.

Q. Then you don't base the inability to conduct a hydrostatic test, so much on the inability to get at each individual tank, but on the fact that you couldn't get inside to clean the tanks first?

A. On both.

Q. Now you said something about solder on side seams of Number Four tank; how far up did that solder go, as you saw it?

A. Oh speaking from memory, anywhere between—I would give the limit about eighteen inches to two feet, say, as the limit. I don't think it would be less than eighteen inches and I don't think it would be more than twenty-four inches.

Q. And did you observe any remains of solder at all above that point?

A. No, sir.

Q. Did you observe—

A. There were none when I looked at it on the boat, when the Court was present.

Q. Did you observe the height of the ashes in that space?

A. No, sir.

Q. The tank compartment space?

A. No, sir.

Q. Then I take it you did not observe the relation between the height of solder in the side seams of Number Four tank, and the height of the ashes in the tank compartment?

A. I wouldn't have taken any notice of that. The boat had been burned up four years, and the debris,—the boat has been sunk, and floating stuff around; it was of no moment to me whatsoever; I don't think it was evidence of anything. That boat has been afloat and sunk, and all sort of things happen in four years. So I wouldn't have noticed that; it was of no moment to me whatsoever.

Q. Did you notice any mark of any kind around the circumference of the tank that indicated a portion that had been more severely subject to fire than any other portion?

A. No, sir, I can't recall now that I did.

Q. Do you express the opinion that those side seams were never soldered all the way up to the top?

A. In my opinion, they were not.

Q. And you base that exclusively on the fact that at the present time, that is when you last saw the tank, there was no solder beyond eighteen to twenty-four inches above the bottom; is that right?

A. No not entirely, sir.

Q. What else?

A. I would expect to find some discoloration from the acid of the flux of the solder.

Q. Did you observe any discoloration along the seams at all?

A. Not that would indicate that it had been soldered, sir.

Q. Was there some discoloration there?

A. There was discoloration all over the tank, but I didn't see anything that would indicate solder.

Q. Did you notice any discoloration that ran along the seam, about the same width, above the point where there was no solder,—above the point where the solder ended, as the solder was?

A. It was not present when I observed the tank last—whenever it was, when the Court was present.

Q. You say that the thing you would expect to see there is the effect of the acid?

A. I would expect to see some slight discoloration from the acid, yes.

Q. What acid is used?

A. Well I have never done any soldering; I know it is an acid flux; beyond that, I don't care to say.

Q. What is the acid?

A. I couldn't actually tell you here under oath; I would rather say I don't know.

Q. What effect does it have on a newly galvanized tank when you put it on, just before you put the solder on?

A. I think it will discolor the galvanizing.

Q. And you think that discoloration would remain from the application of the acid, and the burning off of the solder, if that occurred; is that right?

A. I think, sufficient to show evidences of it, sir.

Q. Did I correctly understand you to say just a moment ago that you had never done any soldering?

A. That is right. I have seen a lot done, but I have never actually done it by my own hand, I mean.

Mr. Underwood:

That is all.

By Mr. Botts:

Q. There was one question that I omitted to ask in cross-examination; I had a mental note of it and forgot to

put it down. If I can back up to ask that question I would like to; I realize that technically I have slipped on my rights, but it is just a question that I have in my mind and hadn't made a note of it; if I may ask it, I will, otherwise not.

The Court:

All right we will let you ask that.

Q. Mr. Thompson assuming that this filler can, Exhibit 13, was filled a considerable number of times from the draw-off valve in the engineroom and emptied outside the boat, and then filled again repeatedly, what in your judgment would be the effect of such a process in creating gasoline vapor or fumes in the engineroom?

A. Well in the process of the refilling you displace the gasoline vapors that are in the can, Mr. Botts, and those flow from the top into whatever space you are filling the can. You get that exactly with your automobile tank, you can see it yourself when you fill your tank, you can notice the fumes coming out,—at least I have; I have seen something that comes out that does not look like air, and I have understood they are gasoline fumes,—gasoline vapor.

Mr. Botts:

That is all.

Mr. Matteson:

That is all.

(Witness excused.)

The Court:

Well is there anything else?

Mr. Matteson:

Would there be any objection to the reading in the record from Kent, the fact that appears on page 4-62, that

the specifications for kerosene, of the United States Government, show a flash point of—a minimum of one hundred degrees.

Mr. Underwood:

No, I don't object to that, providing we can also put in what this pamphlet, called "Fire Hazard Properties of Certain Inflammable Liquids", shows as to kerosene.

Mr. Matteson:

What does that show?

Mr. Underwood:

It shows the flash point varies from eighty-one degrees to 140 degrees relative heat, and that the explosive range is from 1.1 to 7.0.

Mr. Matteson:

All right; that of course is not referring to that, anyway. I would like to read this part: Kerosene is defined—

(Conference between counsel.)

Mr. Underwood:

Go ahead and read it.

Mr. Matteson:

The Kent's Mechanical Engineers' Handbook, eleventh edition, I read the two following excerpts: Kerosene is defined as a refined petroleum distillate having a flash point not below 73 degrees, as determined by the Tag. closed tester, and suitable for use when burned in a weak flame.—Another excerpt: Specifications for kerosene for general illuminating purposes for U. S. Government, given in technical paper 323, U. S. Bureau of Mines, have flash point, minimum, one hundred degrees Fahrenheit.

Mr. Underwood:

Have you, Mr. Bryant, these figures that I read from Libelants' Exhibit 136: the flash point of kerosene, according to this pamphlet, varies between 81 degrees Fahrenheit and 140 degrees Fahrenheit; and the explosive limits vary between 1.1 percent and 7. percent.

Mr. Matteson:

If your Honor please, there is one correction that I happened to note in the record, Mr. Underwood agrees with me on; there may be others, but I notice this one at this time:

Mr. Underwood:

I imagine we both noticed others that we want to comment on later; I noticed several.

Mr. Matteson:

Page 805, the question reads: "Do I understand that it is your view that no ventilators should lead to the bilges of a gasoline vessel?" The question should have read that "Any ventilators should lead to the bilges of a gasoline vessel". The answer was, yes. That was in the testimony of Captain Patton.

The Court:

How do you want to correct it?

Mr. Underwood:

Just get the stenographer to make the correction physically on your copy.

The Court:

If that is agreed, these other things they have read in the record, are agreeable to you, are they?

Mr. Botts:

They are.

Mr. Matteson:

As Mr. Underwood has said, as we go through, we find little things.

The Court:

If you find any more, you have my sanction, just instruct the reporter before he delivers my copies, to make the corrections.

Mr. Matteson:

I wanted to make it clear that in suggesting that, I am not in any way criticising the reporters, because in a record of this size, completed under the pressure, it has been, it seems to me, that they have done a most excellent job, in minimizing such things.

If your Honor please I also want to offer in evidence a deposition which I took at New York, of Andrew J. Smith, a surveyor, who is also Secretary of the Marine section of the National Fire Protection Association; and incorporated in the front of it is a letter that you requested, giving the names of the Officers of the Companies represented by the Marine Office of America: and the exhibits connected therewith.

Mr. Underwood:

I have no objection to the deposition, but in the course of it I made several objections to various questions, and to certain documents that were offered,—which I do not waive.

(The said deposition was admitted in evidence and filed as Libelants' Exhibit 149.)

Mr. Matteson:

Now if your Honor please just one other thing that I have: I would like to make a formal reoffer at this time

of Libelants' Exhibits 131 and 132 for identification, consisting of the record of testimony and the findings by the Mixed Claims Commission. I realize that if we started to discuss this now we would get into a long argument, and we don't want to take the time, I believe, so I just suggest that we deal with the question as to whether these are admissible, or what attention should be paid to them, in connection with our argument, whenever that takes place.

The Court:

Your suggestion is, I just reserve ruling?

Mr. Matteson:

Yes, sir.

The Court:

I have already ruled on that, haven't I?

Mr. Underwood:

You have excluded them.

Mr. Matteson:

You excluded them, and there was some possible reservation in the ruling, as to whether we might offer them as part of our case; but they were definitely excluded at the time that they were offered.

The Court:

Rather than have a reargument at this time, you can cover that in your briefs; just let the record show that the record remains.

Mr. Botts:

The Respondent Pilkington rests.

Mr. Matteson:

We have no more evidence at this time, if your Honor please.

Mr. Underwood:

We rest.

Mr. Matteson:

If your Honor, please, in view of the fact that Mr. Underwood rests at this time, I would like to state that information has come to me—

Mr. Underwood:

I object to any statement on the record about anything at all. Everybody has rested:

Mr. Matteson:

If your Honor please—

Mr. Underwood:

Mr. Matteson has had his opportunity to call any further witnesses that he wants to. I don't know what is in his mind, and I object to his making any statement on the record.

Mr. Matteson:

If your Honor please, I think I am entitled to an answer from Mr. Underwood.

Mr. Underwood:

If he wishes to argue the case, certainly; but if he attempts to incorporate, by his statement, any further fact in the record in this case, I think it is highly improper. I think he ought to be cautioned against it; the record is closed now.

Mr. Matteson:

If your Honor please I would respectfully petition to reopen it, for this purpose, and I will state my reason.

Mr. Underwood:

May I have a ruling on this point? The thing is closed.

The Court:

I don't know what is before me.

Mr. Matteson:

If your Honor please I will state what is before the Court, and the grounds of my application.

Mr. Underwood:

I want to express a view and make a motion; I want to move that Mr. Matteson be instructed not to state any fact at this time, or make any statement of what he considers to be a fact, that is not supported by the record in this case; because everybody has rested; he has had his opportunity; he has waived his rights to go on and put on any further witnesses. The case is closed. I think it is extremely improper and outrageously unfair for him to incorporate in the record any statement of his now that is beyond the four corners of the record in this case.

The Court:

I understand the evidence is closed.

Mr. Matteson:

If your Honor pleases I am moving to reopen it; and the ground of my motion is, that there is certain information in the possession of our opponents, which they have had the opportunity to disclose and produce here, and in good faith they should have, and which they have failed to disclose. I thought they were going to put their witnesses on, following my testimony, and disclose that in-

formation. Now they have failed to do it, and I think the Court is entitled to know it. I think we are entitled to make a motion to reopen this case, on affidavits, and I will procure affidavits if that is required by the Court; but I think it can be disposed of much more simply than this. This is a highly important matter, if your Honor please, and I think the Court is entitled to know that the information which is in the possession of our opponents and which they have had the opportunity to disclose, has not been disclosed; and it certainly was not incumbent upon me to produce evidence as to what they did, as part of my case.

Mr. Underwood:

If your Honor please I don't know what information has come into Mr. Matteson's possession, but whatever it was, it did not come into his possession after he finished his case. He had it as much before—fifteen minutes ago, as he did five minutes ago. You can't have your cake and eat it too. He rested; he had the opportunity to put on any evidence that he might want to put on, to prove any information that has come into his possession, and he didn't do it. He ought not to be permitted to play fast and loose with the Court, and rest with this information in his vest pocket, and spring it after we have rested.

Mr. Matteson:

It is not I that have played fast and loose with this Court. If your Honor please, certainly under any circumstances I would be entitled to make this application, based on an affidavit; and I will produce such an affidavit, if an affidavit is required. But I think, that a simple statement, which will not and cannot be denied by my opponents, will be the basis of my motion, and I certainly think I have a right to state it, unless the Court rules that I have not, in which case I will prepare a proper motion on affidavits. I want to make the motion now and state my grounds for it.

The Court:

I don't see any reason why he could not state it. Suppose I ruled against him; you would incorporate it, file some affidavit, and it would be in the file, even if it wasn't allowed to be stated here.

Mr. Matteson:

It certainly seems so to me.

The Court:

State what it is.

Mr. Underwood:

I move to strike it, if your Honor please. I think the record is closed, and Mr. Matteson had whatever information he has got, he had it in his possession before he rested, as much as he has now. He asked me if I was going to call any witnesses, and I told him I hadn't made up my mind; so he rested under no misapprehension of what I was going to do. I didn't know, I hadn't determined. It seems to me it is highly improper for him to make any statements at this stage. He rested with his eyes open.

The Court:

Well, what is it, Mr. Matteson?

Mr. Matteson:

If your Honor please the motion that I have to make is this: It has come to my information that yesterday the tanks of the Seminole—all four of them, were placed in a plant in Miami; that hydrostatic air tests were applied to them, and that the tanks were cut apart. I would like to move to reopen the record so that I may call one of my opponents' own witnesses, Mr. Munroe, for the purpose of having him testify to that fact, and nothing else.

The Court:

That it was done, and what was found?

Mr. Matteson:

I am not going to ask him what was found; I am simply going to bring out the fact that it was, and let the Court draw its own conclusions from that fact. I certainly think that I am entitled to show that. If your Honor please, the information is developed to our opponents; it seems to me in all fairness it should have been disclosed, and I certainly anticipated that they would have that degree of frankness with the Court, of disclosing what had been done in that particular. It was their time to do it, and after I rested my case I make my motion only after they rested and failed to do that. If your Honor please, this whole case has been the most extraordinary procedure that I have ever heard of. Last May, when we talked about arranging to go out and see this vessel, it was definitely understood that everything would remain as it was, until the Court and counsel should go to visit the vessel, in October, on a date fixed. Instead of carrying out that arrangement, our opponents proceeded immediately, the day following the Court adjourned, last May, to go out there, make arrangements which were completed the following Monday, took the tank out of the wreck, performed certain private experiments, at which no witnesses were present except the man who testified. No one from our side of the case was permitted to be present and observe those tests. The witness has testified to what he observed at that time, and he has admitted on his examination that when we came to examine the tanks in October, the conditions with respect to those tanks were substantially changed, so that there was no opportunity afforded to us to examine those tanks in the same manner as they had examined them, nor to be present and witness the tests that were performed. Now if your Honor please, in addition to that, and without notice to us, or no opportunity to be present, they have taken these same tanks that there has been so much discussion about, they have

taken them to a private plant, without knowledge of anyone else, they have performed tests; and it seems to me that we are certainly entitled to have that fact in the record. And if they don't choose to tell us what the results of those tests were, that of course is their option; but I think we are certainly entitled to have in the record the fact that tests were made.

The Court:

Upon the motion, the reason for it has been stated, do you want to be further heard, Mr. Underwood, on that?

Mr. Underwood:

Will you bear with me just a minute, please.—If your Honor please, it seems to me that it is quite improper to open the case at this time. This is nothing in the nature of newly discovered evidence. Mr. Matteson hasn't denied, and it must be obvious that he cannot deny that he knew as much before he rested as he knows now. So I think that no proper ground has been laid for reopening the case. However, if the Court is interested in seeing the tanks, I have no objection to that whatsoever. The primary purpose of what was done, was to open up Number Four tank and see whether or not it was as badly corroded as the witness Thompson in his testimony Friday or Saturday morning, said that is must be. We found certain things about those tanks which we thought added nothing, one way or the other, to the case; nothing that would be of any particular interest or concern; nothing that would help the Court reach its conclusion on the case. Had we found anything that we considered, of that character, we certainly would have produced it here in Court. Now if the Court wants to look at the tank, or look at any part of them, we will all go and look. Strictly speaking, it seems to me the motion is without any proper foundation whatever.

The Court:

Well I will grant the motion to reopen.

Mr. Botts:

If the Court please, before we get that, there is just one suggestion that I wanted to make here. It is possible, with all the numerous exhibits that have been filed for identification, and then later offered in evidence, it is possible that one side or the other may have filed something for identification and inadvertently failed to offer it, whether admissible or not. I am just going to suggest,— I don't think any of mine are in that category; I am just going to suggest that if it should occur, that when we go to checking up, that some exhibit offered for identification has not possibly been offered in evidence and ruled on, one way or the other, that we be allowed to make the formal proffer at the final hearing, and let the Court rule then whether it is admissible or not, just to avoid anyone's being embarrassed by inadvertence of that character.

The Court:

You mean, some exhibit as to which there will be no question about its being admitted?

Mr. Botts:

Even if it is questionable, it may be admissible, but we want the opportunity of offering it and having a ruling. I don't know that anything of that kind will happen, but with all these exhibits it is possible that somebody might inadvertently fail to offer some that they might deem important. The Court may deem it admissible or not admissible; but in view of the very complicated situation with respect to exhibits, that neither side wants to preclude the other from offering any exhibit which has been marked for identification, merely because we inadvertently overlooked it.

Mr. Underwood:

I have no objection to that.

The Court:

All right, let that be understood. Well, with the granting of the motion now, it is ten minutes of five, I suppose we had better take the course now of letting me appoint Mr. Bryant as the Commissioner, and let him conclude the testimony.

Mr. Matteson:

I have only about four or five questions I would want to ask the witness.

The Court:

I am afraid if we get into that then, the other side will want to introduce Mr. Munroe, and I don't see where it would terminate; so I imagine we had better just let it take this course.

Mr. Underwood:

If we are going to go into this, we want you to come down and see these tanks. I don't want you to have any idea that we have been hiding anything, because we haven't.

The Court:

I don't know exactly when I will go.

Mr. Anderson:

We would like you to go this afternoon.

The Court:

If we just look at them, aren't you going to get something into the record?

Mr. Underwood:

Put it in the record that you looked at them. You see there was a very decided inference from the testimony, or an implication, as we got it, that we had soldered this bottom seam of this Number Four tank. Mr. Thompson has withdrawn any such implication, if there was one.

Mr. Botts:

I can assure you that from discussion with all counsel, that we never had in mind even to intimate that we thought that was soldered after it was removed. I am sure that I didn't, and I don't think the others intended to intimate that it was soldered after it was removed.

The Court:

Well I might go and look at it, but I don't imagine that you want the record to rest there; I think you would want to put on testimony; we have reopened now, Mr. Matteson has indicated he wanted to call a witness from the other side, let him testify; and then if the other side wants to rebut that, that's the only way I know to go at this. I don't think it would be satisfactory just for me to go out there and look at it and then let it rest right there.

Mr. Underwood:

I think it would, because there are some things there that might be worthwhile for you to see.

Mr. Anderson:

I think it is important that you do it now, your Honor, and not wait until after a lapse of time.

The Court:

That might be in addition to the other, but I think you want some testimony, don't you?

Mr. Botts:

Oh yes.

Mr. Underwood:

They are going on with their case again.

The Court:

We are going to conclude, though; I can't go on with this case tomorrow; I have announced and given you notice that I can't go beyond this afternoon with this case.

Mr. Anderson:

Judge, don't you live in Coral Gables?

The Court:

Yes.

Mr. Anderson:

How do you go out there?

The Court:

I can go out, but I am talking about testimony now, that would be hereafter taken.

Mr. Anderson:

We would like for your Honor to see those tanks, if the case is going to be reopened, this afternoon.

The Court:

If you want me to ride by there as I go home, I could go on out there now. Are the tanks at the same place?

Mr. Anderson:

They are much closer.

The Court:

Where are they now?

Mr. Anderson:

They are at a foundry just the other side of the bridge, over the Miami River; and if you go out to Coral Gables that way, Brickell Avenue, it won't be out of your way one block.

The Court:

But I wanted to bring it out so you gentlemen wouldn't expect me to go on with the case tomorrow, because I have other engagements, that I can't give the time beyond tonight.

Mr. Underwood:

I think we all understand that.

The Court:

Hadn't we better deal with the situation on the basis of there being some testimony?

Mr. Anderson:

Yes I think so.

The Court:

Then wouldn't it be better for it to be understood that I will appoint Mr. Bryant as Commissioner to hear the testimony, and let it take its course hereafter?

Mr. Underwood:

That is all right.

(Thereupon the taking of testimony before the Court was concluded, and the hearing was adjourned to be resumed before the Commissioner on the following day.)

Tuesday, November 21, 1939, 2:05 o'clock p. m.

Be It Known, That on this 21st day of November, A. D., 1939, before me, Ernest L. Bryant, Commissioner, duly

appointed by the Honorable John W. Holland, Judge of the United States District Court for the Southern District of Florida, Miami Division, personally appeared Alfred F. Warriner, C. E. Stevens, John A. Thompson, and J. N. Patton, witnesses on behalf of Libelants, and George W. Gibbs and Wirth Munroe, witnesses on behalf of Respondents, in a certain civil cause now pending and undetermined in the District Court of the United States, for the Southern District of Florida, Miami Division, in Admiralty, wherein Charles Coryell, et als., are Libelants, and George J. Pilkington and John S. Phipps are Respondents.

4289 Thereupon: ALFRED F. WARRINER, a witness on behalf of Libelants, was duly sworn and testified as follows:

Direct Examination.

By Mr. Matteson:

Q. Mr. Warriner, what is your business?

A. Machine shop foreman.

Q. Where do you live?

A. Miami, Florida.

Q. What is the name of your machine shop?

A. Warriner & Des Rocher.

Q. And where is it located?

A. 27 Southeast Fifth Street.

Q. Are there at your plant now the four large gasoline tanks from the Seminole?

A. There are.

Q. Within the last week, were some tests performed on those tanks, at your yard?

A. There were.

Q. Were you present when the tests were made?

A. Yes, sir.

Q. Will you tell us what tests were made?

A. Just air pressure applied to the tanks.

Q. What was that?

A. Air pressure was applied to the tanks.

Q. All four of them?

A. All four of them; five pounds of air pressure.

Mr. Underwood:

I didn't hear that; will you read that?

(The answer was read by the reporter.)

Q. Each individually?

A. Yes.

Q. And what position were the tanks in?

A. One tank was upright, and three of them horizontal.

Q. How much air pressure was applied to the tanks?

A. Five pounds.

Q. And how was that determined?

A. How was it determined?

Q. Yes, how was it measured?

A. We had a gauge on the tank.

Q. And what was the result when five pounds of air pressure was applied to the tanks?

A. There was leaks noticed in the tanks.

Q. And how long was the five pounds of air pressure applied to the tanks?

A. About five or ten minutes.

Q. And within that time the leaks were observed?

A. Umh hmh.

Q. How could the leaks be observed? How were they observed?

A. Well the first, we just listened; then the next tank, why we put city water on them.

Q. How did that show?

A. Bubbles in places.

Q. Where were these leaks observed in the different tanks?

A. Down the seams on the side, and on the heads.

Q. Did you make any observations of the bottom of the tanks?

A. Not particularly. The bottoms were kind of dirty, that was all.

Q. At whose request did you make these tests?

A. Mr. Underwood.

Q. And after the tests, was something else done to the tanks?

A. Sections cut out.

Q. Of each of the tanks?

A. Yes, I think there was.

Q. And was the lower section cut off of one of the tanks?

A. Yes; one tank.

Q. That was number four tank, was it?

A. I wouldn't say for sure; I didn't pay much attention to the numbers of the tanks.

Q. Which was the tank that you did not have the soap test on?

A. That was the tank we cut the head off.

Q. At whose direction did you cut the sections out of the tanks?

A. Mr. Underwood's.

Q. Do you know why the soap test was not applied to the number four tank?

A. Well, you couldn't very well apply it on a tank, vertical.

Mr. Matteson:

That is all.

Cross Examination.

By Mr. Underwood:

Q. Mr. Warriner, I was there at the time, was I not?

A. Yes, sir.

Q. Mr. Anderson was there?

A. Mr. Anderson was there.

Q. Mr. Munroe?

A. Umh hmh.

Q. And Mr. Gibbs?

A. That's right.

Q. Were you there all the time while the tests were going on?

A. I was there when the air was applied; when the first tank was being filled full of air—standing on end. The tanks had already gotten there, but the pressure hadn't built up on the first tank.

Q. Now you said that all four tanks were subjected to an air test. Are you entirely certain about that?

A. Yes.

Q. Couldn't be mistaken about that?

A. No, sir.

Q. Did you notice any leaks around the bottom seams of any of those tanks?

A. No, I didn't notice any leaks around the bottom at all.

Q. Did you notice that there was a certain amount of solder up to the side seams for a certain distance?

Mr. Matteson:

I object to that; I haven't asked him anything about that. If you want to make him your own witness, that is all right. This is on cross examination.

Mr. Underwood:

It is cross examination. The question of leaks on the side seams has been gone into.

Q. Do you want the question read, Mr. Warriner?

A. Yes, I would like to hear it.

(The question above objected to, was read by the reporter.)

A. Yes.

Q. Did you observe any leaks where there was solder up the side seams?

A. No.

Q. Segments were cut out from each of those tanks, on Monday, were they not?

A. Segments cut out of two tanks on Monday; two tanks were cut Saturday.

Q. You cut the bottom out of one?

A. Cut the bottom out of one, and two sections, Saturday; the other two were cut out Monday morning.

Q. Well now let's get this straight. On Saturday you cut the bottom out of one tank?

A. We cut the bottom out of one, and a section; and then a section out of another one, and a piece, a flat plate.

Q. Well you cut out of the tank that you cut the bottom off of—

A. Yes.

Q. You cut out of that tank, two sections on the side, did you not?

A. No, sir; we cut out one section, out of the bottom, and one section out of the side.

Q. That is your recollection?

A. Yes, sir.

Q. And is it your recollection that you cut a flat section out of the side of one of the other tanks?

A. Yes, sir; and, cut out a bottom section from one of the other tanks to, at the same time.

Q. Do you remember that you delivered to me on Monday morning three sections of the bottom seam?

A. Two sections.

Q. Your recollection is, two?

A. Yes.

Q. Do you remember that I called you up and spoke to you about the markings on those sections?

A. Two sections were cut out Monday morning; because there were two tanks on the outside.

Q. Well do you remember that I telephoned you on Monday morning about markings on those tanks—on those segments from the bottom seam?

A. No, you didn't talk to me; you talked to the foreman of the shop.

Q. It was the foreman I talked to?

A. Yes.

Mr. Underwood:

All right; that is all.

Re-Direct Examination.

By Mr. Matteson:

Q. Did you make any observation of the bottom of the tank when it stood in the vertical position?

A. No, sir.

Q. Was that standing on ground, or somewhere else?

A. Standing on wooden blocks.

Q. When was it that the air tests were made?

A. At the same time; Saturday afternoon.

Q. Last Saturday afternoon?

A. Yes, sir.

Q. Would you ask the other man to come in?

A. Yes.

(Witness excused.)

4296 Thereupon: C. E. STEVENS, a witness on behalf of Libelants, was duly sworn and testified as follows:

Direct Examination.

By Mr. Matteson:

Q. Where do you live, Mr. Stevens?

A. I live at Price's Tourist Camp, on Northeast 2nd—1st Avenue.

Q. And where do you work?

A. Warriner & Des Rocher.

Q. Have you seen the large cylindrical iron tanks that are at Warriner's shop now?

A. Yes, sir.

Q. And what sort of work do you do in Warriner's?

A. I am a machinist,—or mechanic, rather, and metal-izer.

Q. Were some tests made on those cylindrical tanks last Saturday afternoon?

A. Yes, sir.

Q. Will you tell us what was done? What did you have to do with it?

A. Well I took the plugs out of them and put a gauge in them and tested them with air pressure.

Q. You did the work yourself?

A. I done—Well I done the testing of them; yes, sir; there was four fellows—three of us there; but I was the one that was checking the gauges.

Q. And what sort of a gauge did you use?

A. We used a regular air gauge; a gauge Mr. Warriner has in the shop; and on the other end of the line we used a regulator, that holds the pressure to five pounds.

Q. Do you know whether the gauge is accurate or not?

A. Yes, sir; they are tested by a master gauge.

Q. Was that done?

A. Well I don't know whether it has been recently or not; but it has been, I understand.

Q. What position were these tanks in when the air pressure was applied?

A. Well the first tank that we tested was standing on end; the rest of them were lying on their sides.

Q. How long was the five pounds of air pressure applied?

A. About ten minutes.

Q. And while the air pressure of five pounds was on the tanks for that period, what did you observe?

A. Around the seams, around the top, and sides, small leaks, oh, from ten to thirteen inches apart, something like that.

Q. Was there any liquid in the tanks when this test was made?

A. No, sir.—You said, was there any liquid? I had water in some of them, and drained it all out again, by all but just the moisture; there wasn't any amount.

Q. How were you able to observe these leaks?

A. Well on one of the tanks, the first we tested, we could hear it seeping out; and then on the others we took soap and water and a brush, painted it on; and bubbles formed; we could see the bubbles.

Q. Where did you paint the soap and water on?

A. Seams on the side, and around the top.

Q. A line along the seams?

A. Yes, sir.

Q. Subsequently did you do some other work on these tanks?

A. Yes, sir; I did.

Q. And what was that?

A. Well I cut out some corners or seams out of them; and I took two rivets out of one of the tanks; and filled them with water, and put tetrachlorid in them, so they wouldn't blow up when I cut them. Put some plugs in them.

Q. Did you cut off the bottom of one of the tanks?

A. No, sir, I didn't cut that off; Henry cut it off, but I was working with him when he cut it off.

Q. And what other cutting besides that was done?

A. Well we cut two square places in them, so they would have an air place for the fumes to get out, so they couldn't explode. Then we cut some pieces about six inches long out of each end; I cut those out myself—or out of the bottom end of them.

Q. Were those pieces cut out of each of the tanks?

A. Yes, sir; one piece cut out of each tank.

Q. And the tank that was—that the bottom was cut out of?

A. Yes, sir.

Q. Were there additional pieces cut out of that?

A. No, sir; I don't believe there was.

Q. You don't remember that?

A. I don't remember that for sure; I just cut four pieces out of the bottoms, one piece out of each tank.

Q. When was that cutting done?

A. I done that cutting yesterday morning.

Q. Was some of this cutting done Saturday?

A. Some of it was; yes, sir.

Q. Do you know which was done on Saturday?

A. That piece that was cut out of number four tank, was cut out Saturday; and the pieces that was cut out of the other three tanks, I cut those out Monday morning.

Q. Now you say you cut a rivet out of the top of one of the tanks?

A. Yes, sir.

Q. Was that the number four tank? Or was it the tank that you cut the bottom off?

A. I believe that was number four tank; the tank the bottom was cut off.

Q. And speaking of the rivet that was cut out, at the bottom of the tank, where the convex stands up—

A. Yes, sir.

Q. Will you tell us how you did that?

A. Took a torch and heated the rivet until it was red hot, and took the drift punch and punched it out.

Q. Did you flow the metal?

A. No, sir; just heated it red hot, white hot.

Q. Then drove it out?

A. Then drove it out with a punch.

Q. Then there was another rivet that was cut out on the side seam, of the same tank?

A. Yes, sir.

Q. And how was that done?

A. It was heated with a torch, and drove out with a drift punch and hammer.

Q. Did you use the same sort of a flame on both rivets?

A. Yes, sir, as near as a person could.

Q. And what sort of a flame was that?

A. Acetylene torch; acetylene welding torch.

Q. Did it have four points, or one?

A. One point. The first rivet we cut out, we started to cut it out with a cutting torch—that is an acetylene cutting torch, and we decided it would flow the metal; so we just heated it red hot and—until the welding torch got red hot, and punched it out with a punch.

Q. I didn't quite understand you. You said you thought it would do something to the metal?

A. Well the first rivet we started to cut out, we started to just cut it out with the torch; but if we had, why we naturally would have cut tank and all with the torch; so we didn't do that; we took that cutting tip off and put on an ordinary welding tip and had it red hot, and punched it out.

Mr. Matteson:

That is all.

Cross Examination.

By Mr. Underwood:

Q. Do you remember when I got there Saturday afternoon, number four tank lay on the side, outside of the shed?

A. Yes, sir.

Q. No cutting had started at that time, had it?

A. I couldn't remember. I don't remember just exactly the time you came there; I don't remember positively.

Q. You didn't do any cutting until I got there, did you?

A. I don't remember exactly what time you came there. I don't remember whether they had done any.

Q. Well you didn't make any air tests until I got there, did you?

A. I don't remember when you came down. I don't remember the time you came in there.

Q. Well do you remember when the three of us came down, right after lunch, together?

A. What time was that?

Q. Around half past one; do you remember that?

A. Yes, sir, I do.

Q. You remember there was only one tank there at that time?

A. Yes, sir.

Q. That was number four tank, wasn't it?

A. Yes, sir.

Q. Do you remember that when I got there, there was a hose running water in number four tank?

A. Yes, sir.

Q. And we had to wait until that got filled with water before you could do any burning?

A. Yes, sir.

Q. You never did hook up that air line to number four tank, the one that was filled with water, out there on the ground, did you?

A. Yes, sir; we tested all four of those tanks.

Q. Do you have any recollection of any plugs in number four tank?

A. I think I did; I wouldn't swear to it; I am almost positive we tested all four tanks.

Q. Don't you remember that number four tank was being filled with water when I got there?

A. Yes, sir.

Q. And when Mr. Munroe and Mr. Gibbs got there?

A. Yes, sir.

Q. Don't you remember the truck coming with another tank, and while we were waiting for number four tank to be filled with water, that tank was rolled inside of the shed and put up on blocks?

A. Didn't I take the hose outside and take the plugs outside and put that in, and take them all outside, and put them in the front place?

Q. The first tank that was subjected to the air test, was standing on blocks, upright, inside of the shed, wasn't it?

A. Yes, sir.

Q. In the meantime number four tank was being filled with water, wasn't it?

A. Yes, sir; it was; we filled it at that time.

Q. Isn't it a fact that as soon as number four tank was filled with water, you got your cutting torch and cut out a square piece near the bottom?

A. Yes, we did, but I don't remember—it seems as though we tested all four of them. I don't know, but it seems—I am almost positive we tested all four of those tanks. I think I put air pressure on all of them as they came in. I went outside and made a test on two tanks, then we rolled two inside, then rolled the other back inside.

Q. That is pretty complicated. You are sure about putting air on three of them?

A. Yes, sir; I am positive, and I am almost positive we put it on four; because I know I had to take the hose and all outside to test it while it was laying out there.

Q. You tested one tank on the ground outside, did you?

A. Yes, sir.

Q. You didn't test any tank with air while there was water in it, did you?

A. No, sir.

Q. Now do you remember number three tank, anything about that bottom plug?

A. Yes, sir.

Q. The bottom opening?

A. Yes.

Q. Did you find any threads at all on that bottom opening, in number three tank?

A. No, sir.

Q. There are threads there today, aren't there?

A. Yes, sir.

Q. How did they get there?

A. Henry took a two-inch tap and ran through there and put threads in it.

Q. Did you see him do that?

A. Yes, sir; I stood there.

Q. Do you think you can identify the piece that you cut out or saw cut out of these tanks?

A. Yes, sir.

Q. I show you a more or less bare piece of metal with an arrow, re arrow, on it?

A. Yes, sir.

Q. Will you tell me where that came from?

A. Came out of the side of a tank; I think it came out of number four tank.

Q. That is the tank from which you cut the bottom?

A. Yes, sir; from the tank we cut the bottom out of.

Q. Can you be sure whether that is the upper piece that was cut out, or the lower piece?

A. That is the upper piece.

Q. That you cut out Saturday?

A. Yes, sir.

Mr. Underwood:

I offer that.

(Said section of metal was admitted in evidence and filed as Respondents' Exhibit 5-V.)

Q. Now I show you another piece; don't read what is on there, but just look at it and tell me whether you can identify that.

A. It is a piece out of the side of one of those tanks.

Q. Well you only cut pieces out of the sides of one tank, didn't you?

A. Yes, sir.

Q. So it must be out of the same tank that this other piece is out of?

A. It must be.

Q. And that's the lower piece, is that right?

A. Yes, sir.

Mr. Underwood:

I offer that, and for your information I will say that the words, painted on it in red, "From number four tank, a part cut from side, thirteen and a half inches above bottom", and then upside down, the word, "bottom", were painted on there by Mr. Munroe.

(Said section of metal was admitted in evidence and filed as Respondents' Exhibit 5-W.)

Q. Now did you mark in any way the piece, the segment that you cut out of the bottom of number four tank on Saturday?

A. I didn't mark it.

Q. Did you see it marked?

A. No, sir; I didn't.

Q. Well I wasn't there on Monday when you cut out the segments from the bottoms of the other three, was I?

A. No, sir.

Q. Did you cut those yourself?

A. I cut those myself.

Q. Did you mark them?

A. Yes, sir.

Q. With what?

A. With red paint.

Q. I show you pieces of metal; can you tell me from which tank they came?

A. Well I marked all the other three pieces; they must be from number four tank, because I marked all the rest of them.

Q. After you cut the piece out of the bottom of the segment, what did you do?

A. Took my hacksaw and sawed off the ends of them.

Q. So these two ends of this piece don't represent the metal as it came out of the tank?

A. No; that is the same metal that came out of the tank, only it was put in a saw and sawed off.

Q. You sawed something off of each end?

A. Yes, sir.

Q. Well were the ends of this segment from the bottom, when it came out of the tank, burned in the manner somewhat similar to the edges of Exhibit 5-W?

A. Yes, sir; they were burned out.

Mr. Underwood:

I offer this, and mark it 5-X.

(Said section of metal was admitted in evidence and filed as Respondents' Exhibit 5-X.)

Q. I show you another bottom segment, with \pm 1 painted in red on it. Did you cut that out?

A. Yes, sir.

Q. And from what tank?

A. From number one tank.

Q. Where did you get the number of the tank?

A. On the head end of the tank; top end of the tank.

Q. And you sawed this—sawed the ends off of this with a hacksaw?

A. Yes, sir.

Q. The same way as the others?

A. Yes, sir.

Mr. Underwood:

I offer this, and mark it 5-Y.

(Said section of metal was admitted in evidence and filed as Respondents' Exhibit 5-Y.)

Q. I show you another piece, with a red "2" on it; did you cut that out?

A. Yes, sir; I did.

Q. From what tank?

A. Cut that out from number two tank.

Q. Did you saw the ends off?

A. Yes, sir; I did.

Mr. Underwood:

I offer that, and mark it 5-Z.

(Said section of metal was admitted in evidence and filed as Respondents' Exhibit 5-Z.)

Q. I show you another segment, marked #4; did you cut that out?

A. That was the last tank we worked on, and it was number three tank; the fourth tank that I worked on, and just automatically, by being the fourth tank, I put Four on it; but that came out of number three tank.

Q. This segment with #4 painted in red—

A. Actually came out of number three tank; but it was the fourth tank that I worked on, that is how the "four" came to be on there.

Mr. Underwood:

I offer it, and mark it 6-A.

(Said section of metal was admitted in evidence and filed as Respondents' Exhibit 6-A.)

Q. In burning out these rivets you did, at least a part of the time, use a tip that had four jets in it, didn't you?

A. Yes, sir; we started to use it, and then stopped; just got the rivet hot, and started to use it, and then stopped.

Q. Did you do that on both rivets that you punched out?

A. No, sir; just one rivet.

Q. The first one you punched out, was at the head of the tank?

A. Yes, sir; it was.

Q. And the seam that goes around the top of the tank?

A. Around the top of the tank.

Q. The second one was punched out very near—

A. The bottom side.

Q. Bottom side; and when you did that, the bottom had been cut off?

A. Had been cut out.

Q. And the point you were working on was upwards?

A. Upwards; up in the air.

Q. Did you handle hammer or punch?

A. I handled the hammer and punch.

Q. You had to get that part hot to get it out?

A. Yes, sir.

Q. You hadn't to burn the shank of the rivet all the way through, in every case?

A. No, sir; we just got the rivet red hot.

Mr. Underwood:
That is all.

Re-Direct Examination.

By Mr. Matteson:

Q. I want to ask you another question or two. Did you do anything else to these pieces that were cut out of the tank, Exhibits 5-X, Y, Z, and 6-A?—these four pieces?

A. I took the three I cut out, and took a steel brush and brushed them off; the three that I cut out Monday morning, I took the steel brush and brushed them off.

Q. And did you do anything to the edges of them?

A. Just sawed those edges off, was all.

Q. Well, did you see any one else do anything else to these edges?

A. Yes, I did; when they are sawed out there was a razor edge on them; I done that to keep some one from cutting their hands; I took a file and gave them a rap across the edge with a file and knocked that razor edge off; because the saw will leave a razor edge.

Q. Did you use a hand hacksaw?

A. No, sir; used a power saw.

Q. Do these pieces that I have referred to, these four sections, of the bottoms of the four tanks, look now the way they did when they came out of the tanks?

A. They do outside of the ends being sawed off of them.

Q. And the brushing?

A. And the brushing.

Q. Well, what difference in appearance does that make?

A. Just cleaned them up, is all; they would have been pretty dirty to handle, with rust scale and all on them, without brushing them off.

Mr. Matteson:
That is all.

Re-Cross Examination.

By Mr. Underwood:

Q. Nothing but loose materials were brushed off of any of them, was there?

A. That's all; just took it off with a hand brush.

Q. Now the razor edge you spoke of taking off with a file, that was on the corner, was it not, on the flat edge of the plate, was it not?

A. Just the corner; the sharp corner right there.

Q. And these corners here?

A. Yes, sir.

Q. And you didn't put your file on the flat edge of the plate at all, did you?

A. No, sir.

Q. On any of them?

A. No.

Mr. Underwood:

That is all.

Further Re-Direct.

By Mr. Matteson:

Q. Isn't it a wire brush you used to clean them?

A. A wire brush; steel brush.

Mr. Matteson:

That is all.

(Witness excused.)

(Informal recess was had.)

4311 Thereupon: MR. JOHN A. THOMPSON was recalled as a witness on behalf of Libelants and further testified as follows:

Direct Examination.

By Mr. Matteson:

Q. Mr. Thompson, did you accompany the Court and counsel to Warriner's machine shop yesterday afternoon, and there observe the tanks of the Seminole?

A. Yes, sir.

Q. And did you again observe those tanks in the presence of counsel this morning?

A. Yes, sir.

Q. Now will you tell us what your observations were with respect to those tanks?

A. You mean, in general, or in particular?

Q. Well I want you to take up the individual tanks, each of them; and also any observations that apply to all of them.

A. Well I observed the exterior of all four tanks. I observed the interior of one tank—I think it was number four. In my opinion, the plating generally was corroded and pitted, wherever I observed. I observed that the fittings varied in the tanks; that three of the tanks had brass plugs at the bottom, and one had an iron plug.

Q. Is that what you refer to as a reducer?

A. No, I am just referring to the plugs, first.

Q. Was that on the bottom of the tank?

A. Bottom of the tank, yes, Mr. Matteson. I observed that the metal in the way of the inlets,—that is what I would call the top of the tanks, the metal was brazed. I observed that the fittings of the bottom of the tanks—outlets, was not all the same; that they varied considerably. I observed that the bottoms of the tanks were all—or had been all soldered around the bottom of the lap of the end. I observed—at least I failed to observe

any soldering around rivets in the way of that seam, nor the vertical seams. I observed that the tops of all the tanks had an opening between the top of the side plates, that is the inner edge of the top of the side plates, and the crown plate, in some places—

Mr. Underwood:

Had no what?

A. I observed the space—

Mr. Underwood:

I thought you said, had no—something.

(First answer on this page, read by reporter.)

A. —quite a noticeable opening. I observed that the joint rivets—that is the top rivet on the vertical seams, had a space adjacent to them in which I could put my pen knife, to the extent of approximately three sixteenths of an inch, to approximately five sixteenths of an inch. I had a photograph taken of one of those pieces. I consider from that particular thing, and the fact that the plate had not been properly thinned out during the course of the building of the tank, that in my opinion those tanks were not built to contain any liquids of a dangerous character: because from my experience, plates that were so fitted should be welded, in any case, at that point. I observed that certain pieces had been taken out, burned out, of all of the tanks; and that the bottom of one tank—I believe number four tank, had been burned out completely, from a point I think approximately—I didn't measure the point—from a point six or eight inches above the bottom. From my observations of the whole of the tanks, I still maintain the opinion I have always expressed, that I see no reason why I should criticize their structural strength, even today, but I still confine my criticism of

them as gasoline tanks, only insofar as the tightness was concerned. I observed on one of the tanks, number two, that one of the vertical seams had been damaged in the process of manufacturing; that is during the process of shearing the plate; that through inattention or from some other reason I don't know anything about,—what I call bad workmanship, the shear blade had been allowed to cut into the landing edge of that plate, and thereby causing an imperfect seam; and in my opinion that plate should either be made good by welding, and afterwards machined, or should be condemned. In my opinion, that tank was defective at the time it was built, and after it was built.

Q. Did you make any other observation in respect to that part of the tank?

A. That particular part?

Q. Yes.

A. Oh, yes. At the point of this imperfection, and particularly at its greatest depth, away from the landing edge, which as I say was about—I measured about 5 32nds—it will show in the photograph, I observed that the landing edge was free of the plate; that I could insert the blade of my pocket knife in it. Furthermore, I observed adjacent to that imperfection, a series of clear water—of balls, just small balls of water. That particular tank, at the time I made my observations, was partly filled with water; and just before I made the observation, I think on that particular tank, assisted by Captain Patton and Mr. Munroe, rolled the tank over a little in order to bring that seam into close observation. It was immediately thereupon that I noticed that imperfection that I have spoken of, and also those little balls of water I have spoken of.

Q. What is the significance of the balls of water?

A. Well I looked closely at it, and in my opinion they indicated that that seam had leaked since water was put

in, and apparently that was subsequent to any air pressure that had been applied to the tank. I have no knowledge myself, of course, of any of those air tests. I did observe in some of the tanks at least that, up and down the vertical seams, and along the horizontal seam of the tank, what had apparently been a mixture of soap and water, had been applied; but I was not satisfied that the lines that ran from—that same material running from that particular line mentioned—was caused by any air pressure, though probably caused by an excess of the testing fluids. So I don't think I could say that there is anything in evidence on the tanks as I observed them today, or yesterday, of any leakage of air, due to such tests.

Q. Before we leave this space at the side seam, that you were speaking of, where you said you observed the drops of water, at the time you made that observation was there water in the tank?

A. Yes, I think I said, it was partially filled, I think.

Q. And how was the level of the water with respect to that seam at that time?

A. At my inspection here, taking into account the amount it had rolled, or at least I helped to roll it, the pressure was less at the time that I actually observed it than it had been slightly before I rolled it. I estimate, and I confess it is but an estimate, that the maximum head of water on that seam, provided that tank had remained in the position in which I first found it, I estimate that the maximum head on that particular seam would have been somewhere certainly not in excess of twelve inches, or a half pound per square inch; it may be less, but I don't think any more.

Q. Well was the water inside the tank at that time you made that observation, higher or lower than the seam?

A. Well to be perfectly true, I didn't measure it, and I can just give you what I think on that. At the time

I made the observation, I think some of the water had spilled out of that tank; I don't think much came out through the outlet; but I don't know whether at the time of the observation, whether the water was actually above the seam or below it. That is an observation I say, that will approximate probably about the level of the seam at that particular moment that Mr. Matteson is referring to.

Q. Just a minute, before we leave that; you say the tank had been rolled just before that?

A. Yes, I think it had been rolled sufficient—I just made an estimate, I didn't measure the length of the roll or the amount that the seam had come up; but, I think we rolled that tank somewhere between eighteen inches, I should imagine, as a minimum, to three feet as a maximum. I think eighteen inches would probably be a nearer guess, to the guess, than three feet.

Q. You spoke of a twelve inch head; what did you mean by that?

A. Well, I spoke as to the twelve inch head, it was my estimate as to the load—the distance between the head of the water then in the tank, and the seam, before we started to roll.

Q. At that time the water, I take it, was that much above the seam, according to your estimate?

A. That was my estimate, from my observation, but I didn't measure it. You asked me about the construction of the tank, and I think I have given you two observations; but there is another. I still fail to find on any of the four tanks, any evidence of caulking. I did observe that all the plates, as far as I could see them—I couldn't see all of the plates but I should imagine that the crowns were machined edge inside; but as far as the vertical plates are concerned, both as to their vertical edges and their horizontal edges, at least the horizontal edges on the top of the tank, because I looked at them

particularly, that they had been cut to the required dimensions by a plate shear; and there was evidence, apart from the fault I have mentioned, there is still evidence on those plates of them having been cut by a plate shear, and not planed, as has been my custom in building any kind of vessel, that we wish to use for any duty other than containing water.

Q. Did you observe a point that was pointed out on one of the tanks by Mr. Gibbs, where it was indicated there might have been caulking?

A. Pardon? (Question was read by reporter.)—No, Mr. Gibbs didn't point that out to me, Mr. Matteson. I didn't have any discussion with Mr. Gibbs on that; at least I can't recall any such conversation. Do you mean he called it to my attention, as having been pointed out?

Q. Well if you don't know—

A. My particular attention was called, not by Mr. Gibbs, to a particular spot, I looked at that; but that wasn't called to my attention by Mr. Gibbs.

Q. Where was that spot?

A. Well I don't know the tank it was on. Mr. Botts called my attention to that, and I examined it, and failed to find any signs of caulking there.

Q. Did you observe anything there?

A. I have stated, I failed to find any traces of caulking on any parts of the tanks I looked at. The other observations I made, and I think I made them in relation to the particular tanks, but I think I would apply them generally, because the same conditions seemed to be more or less general, varying in different places,—that they were riveted heads. I am speaking of the rivets now in the tanks, both around the bottom seam and the top seam and the vertical seams; they were riveted heads; that is that part of the rivet that had been hammered down, either hot or cold, I observed that quite a considerable number of them were cracked, some of them in sev-

eral places; that quite a considerable number of them had wasted very, very badly. And I observed that the rivet head in many cases had not come down to the plate; by that I mean that it was visible, a visible distance between the under side of the riveted portion of the rivet, and the plate below.

Q. What is the importance of that?

A. Well in my opinion, it was there to some extent originally, but if not that, it was either that, or heavy corrosion had been taking place, which had reduced the rivet in that particular spot, since the construction of the tanks. Now I of course have no means of telling which is correct, or whether both are correct; I wouldn't know. I can only tell you what I found.

Q. What would be the effect of such a condition on the tightness of the tank?

A. Well if I had found a rivet of that description—I will put it this way; if I found a rivet of that description at any time, in a tank, I would immediately condemn it and have it renewed.

Q. My question, Mr. Thompson, was, what would the effect of such a condition be on the tightness of the tank?

A. I think it would have a detrimental effect on the tightness of the tank.

Q. Why?

A. Because, you tighten your rivet there—you depend upon, briefly, the complete filling of the rivet hole by the rivets, the shank itself. But the head—I have never had—the head had either never had, or had subsequently lost the property that is called—the duty that it is called upon to do—that is to remain to help in keeping that tank tight through that rivet hole. That is a duty apart from merely the attachment of the two plates by means of the rivet.

Q. Now you spoke of a variation in the fittings of the bottoms of the tanks; you didn't give us any details with respect to that.

A. Well I think I could give you perhaps more details when I see the photographs; in the meantime, they seem to be out of character altogether. And while not denying the right of a man to use any fittings he likes, my own judgment is that if those fittings had been supplied by the tank maker, at the same time that the tanks were all delivered as one order, it would indicate that he was a very poor tank maker, unless his instructions were to do such a thing. Or if they had been fitted by any one subsequent to the delivery of the tank, my own impression is—and I must admit it is just an impression, that he had used—he had not taken care, proper care in putting the fittings of a uniform character and design, and that he had actually used such fittings as he had convenient at the time.

Q. Did you notice the size of the reducer in the number four tank?

A. I did, but I did not actually measure that, because—I feel I have already said enough about that, and I don't want to say any more. But I did notice there was a difference in the bore. Now there are other things I observed in connection with those fittings.

Q. Well before we get to that, you saw a reducer fitting in the number four tank, did you?

A. Yes, I saw the reducer fitting.

Q. And you saw a reducer fitting in some of the other tanks, did you not?

A. Yes, some that were out and some were in; they were taken in and out while I was there. Even those fittings, I didn't actually try the different tanks, although I was down there, they couldn't get the fittings, sometimes, and manage to get them in with the right threads.

Q. You spoke of the difference in bore; what did you refer to by that?

A. I mentioned that; I said the fittings, in bore, of the reducer itself, not the outside periphery; not the periphery but the bore in the center of it, to which would be attached the outlet fitting connecting to manifold or other line.

Q. Well now what was the difference in bore between that fitting and the other fittings?

A. I didn't measure that.

Q. Can you tell us in a general way?

A. Well they were noticeable, I know: I think I would have to be satisfied with that; I didn't measure them.

Q. Well put it this way: was the reducer in number four tank such as would have taken a 3/8ths line?

A. Pardon? (Question was read by the reporter.)—Well I think it is only right to say that I haven't definitely fixed in my own mind the difference in fittings in relation to any particular number of tank: so I don't think I can answer that. I am sorry, Mr. Matteson, if I have dropped down on that for you, but I didn't actually connect the various bores with any particular number of tank.

Q. Without connecting it with any particular tanks, you saw the reducer fittings?

A. I did.

Q. Were they such as would have taken all of them, a similar sized pipe?

A. No; no, they were different bores, and noticeably different. They were so noticeably different that I really didn't think it was worth while measuring them, because they were observably different.

Q. Well when you say, observably different, do you mean, small difference or great?

A. It seemed quite enough, to be able to distinguish there was a difference in the size, without going to the trouble of measuring them; just looking at them, it was apparent.

Q. Well can you give us some estimate of the fitting which the larger coupler would have taken?

A. Well subject to the qualifications I have already mentioned, of course, I have to depend upon my memory,—I think this will be probably under what I actually think; I will give you a minimum, that the fitting varied at least $3/16$ ths—fittings and bore; but I can't connect which tank was the small one or which was the large one. But I would give you a minimum of $3/16$ ths; and my own frank opinion is, it would be considerably more; but I would be safe on that, not having measured them.

Q. Now I think you were going to—

A. I think that they were considerably more, but I am just—

Q. Were those openings illustrated in one of the pictures that were taken?

A. Pardon? (Question read by the reporter.)—I think so. I asked the photographer to note that, and I really depended more on the photographs, than my evidence—my actual memory. I want my memory refreshed by the photograph. I didn't know you were going to ask me that question, and I have had no notice about questions you would ask me on this particular line, so I am just stating what I actually remember, or what notes I have taken.

Q. Well, we will have the pictures here in a few moments.

(Discussion was had off the record.)

Q. Mr. Thompson, I think you were going to take up your observations of individual tanks; will you do that, please?

A. Well I think I have covered quite a lot of it. I should say that I want to correct evidence I have given before in this case, from an observation now I have made

on the tank itself. I think my evidence states that in my opinion, from the observation that I had,—and frankly I thought it was this; but I said they were $3/8$ ths, but I wanted to be on the right side, and I thought they were $3/8$ ths diameter. My observation now from the hole—two holes I observed, in I think number four tank, I know one is not far away from where the tank had been cut at the bottom, that was on the vertical seam, and I think the other was on the circumferential seam at the top of the tank: I wish to correct my evidence in this respect; that I believe the rivet used there was a $5/16$ ths rivet, and not a $3/8$ ths.

Q. Why do you say that?

A. Because I measured the hole; I find a $5/16$ ths rivet was the biggest rivet you could put in.

Q. What is the significance of that?

A. Well if these plates were $3/16$ ths in diameter—in thickness, I mean—I know to my own knowledge that $5/16$ ths diameter rivet would not be considered satisfactory for a $3/16$ ths plate—too small. The minimum rivet is $3/8$ ths, to be used; and my opinion, based on experience, I would say that that would be detrimental to the tightness of the seam. I made certain observations regarding those two holes I refer to; the lower hole I mentioned seemed to have been burned out—at least the rivet had been burned out, I mean; and the plate was locally considerably bellied or pressed in the way of that hole: The other hole was not compressed, but disclosed that the holes originally had not been opposite one another, and the holes therefore had not been reamed out during manufacture. It is my opinion that the rivet that had occupied that hole, had been an imperfect rivet.

Q. What effect would that have?

A. That again I think has a detrimental effect on the tightness of the seam and upon the strength of the rivet, and can be definitely considered bad practice.

Q. Did you make any observation with respect to the manner in which the fittings at the bottoms of the tank were affixed?

A. Oh—well only in relation—as far as I could feel, on those I could get at, in three of the tanks. I should say that all the tanks were similarly fitted, with doubling plates in the way of the fittings.

Q. Doubling?

A. Doubling plates.

Q. In the way of what?

A. In the way of these other fittings; that is of course the usual practice.

Q. What is the purpose of the doubling plate?

A. Well the doubling plate of course is to increase the thickness in the way of the fitting, so as you get a better attachment for your fitting; you get a longer—thicker piece of metal to screw into. Before doubling plates are fitted in a tank or other structure, which has to be even water-tight, it is good practice and ordinary practice, as far as my experience goes, to use water-tight pitch—spacing, if you prefer, of rivets, to attach those doubling plates to the tank or other structure. I did not observe, nor recall—I did not observe the spacing of the rivets in these doubling plates any more than in the one tank, which I believe was number four tank, which had the bottom cut off; I confined it to that doubling plate, because that doubling plate I could see readily, and without any possibility of making a mistake as to the pitch of the rivets. The doubling plates, which were square in shape, in that particular tank I looked at, were attached by four rivets to the shell of the tank, one rivet in each corner. The pitch or the spacing of the rivets in that particular doubling plate, I think I took—I think it is two and 5/16ths—

Mr. Botts:

Inches?

A. Yes, two inches and $\frac{5}{16}$ ths. No, I haven't that in my notes, but I asked Captain Patton to check that dimension with me and to make a note of it, and I believe he did so at the time.

Q. Well before we leave that, Mr. Thompson, you spoke of the ordinary pitch or spacing of rivets for water tightness; with respect to a tank that was tight, what would that be?

A. Four diameters.

Q. And in inches what would that be?

A. It depends upon the size of the rivet. In this case it would be $\frac{20}{16}$ ths; in the case of $\frac{5}{16}$ ths rivet, it would be $\frac{20}{16}$ ths; that is an inch and a quarter.

Q. Well then is that center to center?

A. Pardon?

Q. Is that center to center?

A. Center to center; yes; from outside edge to outside edge; but center to center, we count it; we always do the pitching to center-line.

Q. In this tank, if that doubling plate had been fitted for water tightness, what would have been the pitch and the distance apart of the rivets?

A. I just said, an inch and a quarter, center to center; that is four times $\frac{5}{16}$ ths.

Q. Now what is the effect of that?

A. The effect of that is that you have a water tight pitch, and that you have—I should say if those plates were not caulked, those doubling plates were not caulked; the tightness depended entirely upon the spacing of the rivets. —you have a joint then that in my opinion is not water tight; that is that liquids, particularly under any pressure, would be apt to creep, between the two surfaces of the plates; that is the inner face of the doubling plate, and the face of the plate to which it is attached. Therefore the threads in the doubling plate would not be considered as a proof of the tightness of the fittings; as the

pressure would come on the tank side of the doubling plate—that is the side of the doubling plate close to the tank, rather of course than where it should be, on the inner side, that is the side towards the center of the tank. Even supposing then that you have your fitting also threaded through the shell of the tank, all you have for tightness would be the threads in the thickness of the tank. To my knowledge—

Q. Could you make a drawing and illustrate to us what you are telling us?

A. Oh certainly.

Q. A pencil?

A. No, I think I have one here. You want just a sketch—

Q. Describing what you just told us.

A. This is not to scale, just merely a sketch, and I don't know if I am putting the right dimensions or not; I have no intention of showing a larger distance than four diameters, so I will put quite large rivets in the corner. Now I will take the tank side plate—this is a hypothetical case, Mr. Matteson; I am not referring this as to the—(witness draws). Now on one side I will put a thread extending through the plate, also through the—in the other case I will put a bored hole. I won't be able to get my fitting in if I don't mind; the worst of these sketches. I do not offer this sketch to sample my draftsmanship, just merely to illustrate the point I have been giving evidence to. In this sketch, on the right hand side—

Mr. Botts:

Let's identify this, so we can refer to it in that way.

(Said sketch was admitted in evidence and filed as Libelants' Exhibit #150.)

A. This sketch does not refer in any shape or form as to dimensions, to the doubling plate that has been referred

to; this is just describing what I mean. Do you want me to mark anything on it?

Q. Just mark it as you have called attention.

A. I will put this, a section—call that section?

Mr. Botts:

Section—tank, wall, put it.

A. We will call that—perhaps we might call that Plan, or Elevation; it doesn't matter which it is, Mr. Gibbs; I will take his choice. Is Plan all right, Mr. Gibbs?

Mr. Gibbs:

Yes, exactly right.

Q. On the right hand of the sketch—of the paper, there is a sketch which is the section through the side wall—that is the tank side, if you like.

Mr. Dyer:

Mark that.

A. Call that—that there is called, A?

Q. Call it tank side.

Mr. Underwood:

Side plate of tank.

A. Side Plating, will do? This is Doubling.

Mr. Botts:

Doubling plate.

A. Doubler, shall we call it?—All right.

Q. Now, on the Plan, indicate the rivets, and the—

A. I will describe the pitch of the rivet there in that case, is from the center of the one rivet on the left hand

side of the plan, to the other rivet hole on the side of the—on the right hand side; we will just call that "pitch of rivets"; is that good enough, to refer to that? Pitch of rivet. That is the same thing this way too.

Q. What is the hole in the center?

A. Well I put this in in two ways; in sections I have shown the hole as if it had been tapped right through the full depth, through the side plating and the doubler. On the lower half of that section I have shown it as a plain hole through the plate,—a plain drilled hole and tapped through the doubler. We will call that, Bore, or Hole; that hole refers to the place for the fitting.

Q. Now will you point out to us how the effect that you were describing, operated?

A. Well in my opinion it would be impossible to guarantee water tightness of the edge—shall I mark "A"; A to B; because that edge has not been secured to the side plating by a water tight pitch of riveting. The effect of that would be, that if the side plating as indicated on the lower half of the hole in the section, were not tapped, the tightness of that fitting would depend upon the tightness of the joint A to B.

Mr. Underwood:

Could I interrupt you just a minute?

(The answer was read by the reporter.)

Q. And by tapped, you mean, threaded?

A. Threaded, yes. But if the threads, as you prefer to call it, were continued through the side plating, the joint would then depend solely, in my opinion, upon the threads in the side plating.

Q. Now what is the importance of that?

A. I don't think it is a good joint; entirely contrary to the whole of my experience.

Mr. Botts:

Could I ask a question right here while I have it in mind, so I won't have to come back to it? Mr. Thompson, if I understand you correctly, in non-technical terms, you mean to say that because the rivets were too widely spaced, they would not be sufficiently close to draw up a tight joint, and the contents of the tank would be likely thereby to leak through the joint A to B, up as far as the threads; and if it were not a threaded joint, then there would be nothing to prevent the liquid from leaking out; and if it was a threaded joint, it would depend upon the—

A. No, you are taking me too far. I don't say that, because you might have then a fitting—I am assuming this is a flat plate, not a circular plate. In a circular plate, in my opinion, it would do that, that you suggest. But if this were a flat plate, you may have a type of fitting to which you could have an additional joint by a shoulder on the fitting and the insertion of a packing material; or by the grinding of those two surfaces at a greater diameter than the hole. Do you follow what I mean? I will etch in such a shoulder and call—the diameter of that will be indicated by the letter "C". The packing material, or the ground joint could then be—I will put that in red, now; as shown by the red line marked "D". Is that clear?

(By Mr. Matteson):

Q. In other words, what you are indicating here is that if the fitting which was screwed into this hole had a flange on it, there might be some way of getting a ground fit between the flange and the side of the tank?

A. Provided you are tightening up against a flat side. Of course you can't use a shoulder and get a joint on a circular surface.

Mr. Botts:

Well, this was a circular surface, wasn't it?

A. The tanks were, yes, sir. Did I make that clear?

Mr. Botts:

That is all right.

(By Mr. Matteson):

Q. Did any of the coupler fittings which you observed on the Seminole tanks, have such flange?

A. I didn't observe such flanges, no, sir.

Q. Now I call your attention to Exhibit 6-A, which is one of the sections which has been offered in evidence here, and ask you what you observed with respect to that?

A. Well I haven't seen this exhibit, until it was brought into Court this afternoon.

Q. I am particularly referring to the rivets.

A. Oh, the rivets; well the snap-heads which formed the original head of the rivet before it was inserted, seem to be in fairly good order. May I just examine those heads just a little further? (Using pocket knife.) I won't destroy any evidence, Mr. Underwood. I don't think I need to—a bare touch would indicate the center head of the rivet to which I have just referred was either not wholly driven home, as we call it, or forced up to the plate, or has subsequently corroded underneath; I don't know which,—or perhaps both. And the present appearance definitely shows that that rivet—the head is away for at least part of its periphery, from the plate itself.

Q. What is the significance of that?

A. Well, you have asked me the significance of that; the significance of that, to me, is that fluids or any other thing that may cause corrosion, may get—is likely to get at the shank of the rivet and rust the rivet inside the hole; and to whatever extent that shank is affected, will likely cause seepage.

Q. You are referring now to the central rivet?

A. Central rivet, and to the manufactured head; not the head riveted during the process of riveting; the original head. Looking at the rivets on the other side, that is I believe the outside of the tank—have you got a magnifying glass here? May I go to the window? (Witness going to window.) I think that is almost visible with the naked eye, without looking at it through the magnifying glass. Take the rivets in order, looking at the plate from outside, with the rivets as the top side of the exhibit, the head of the first rivet is definitely broken.

Q. Now, so we will know what rivet you are talking about.

A. On the right-hand side, with the rivets at the top; would that be clear?

Q. It is better.

A. The first rivet, counting from the right-hand side of the rivets at the top, is definitely broken. In fact, to be quite fair, I mean part of the top of the head is broken; I am not referring to the shank, by any means. The second rivet is in very bad shape, as one can observe, on the upper side of the rivet,—the rivet hole. The third rivet—may I have that glass again: the third rivet has either never been driven home properly or has wasted considerably.

Mr. Botts:

Or has what?

A. Wasted considerably between the plate and the riveted head of the rivet; and that is to the extent that you can see the hole, at the top of this rivet. Now the fourth rivet I want to use a knife; is there any objection to using a knife?

Q. Go ahead until somebody stops you. (Witness goes to window.)

A. The fourth rivet from the right is an extremely bad rivet; it shows that the tank was in my opinion not carefully manufactured; that the holes, before the rivet was placed in, were not opposite; that the center of the rivet on the outside of the tank is visibly higher or lower, whichever way you happen to be looking at the edge of the seam, than the head of the rivet—that is the riveted head is not the same center, by any means, as the rivets. I think that constitutes, and did constitute a poor rivet.

Q. And why is that, Mr. Thompson?

A. Well I think I could describe that better by giving you a sketch.

Mr. Botts:

All right, go ahead.

A. Before making a sketch, I would like to refer to the next and final rivet; that is the rivet in the left-hand corner, looking at that portion of the tank plate from outside, with the rivets on the top. The succeeding rivet—that is the final rivet, shows a similar defect, but not to quite the same extent. I will now explain what I mean, by means of a sketch. I will do it in larger scale than the exhibit, purely for the purpose of showing it perhaps more clearly. I want to show the sketch before I add in the rivet.

(By Mr. Matteson):

Q. All right, you can proceed.

A. This sketch indicates a seam of two plates, the overlap of the seam being from point A to point B.

Mr. Botts:

Wait a minute now, suppose you draw two sketches, one showing the hole without the rivet, and then another sketch putting the rivet in.

A. If you would like it that way.

Mr. Botts:

Then let it show how the hole was before the rivet was put in.

A. I was intending to do it with red pencil, but I will do it the way you suggest now. Now on this sheet I have drawn two rough sketches, the upper one showing the plates brought together with the holes not opposite one another. I am trying to explain this in just simple language. The holes,—the overlap, as I stated, of the two plates is located A to B on the sketch; the hole on the upper plate being marked C, and the hole in the lower plate being marked D. Good practice, through the whole of my experience, and which is confirmed by various sources to which I could refer you in writing, calls for, in the event of this misalignment of holes, for the reamering of the holes. That practice consists of using a drift. It would have been impossible, in my opinion, with a normal hole clearance, to have inserted the rivet in either of the two rivet holes—last two holes to the left of the exhibit, without the use of a drift.

Mr. Botts:

Explain what a drift is, right there. •

A. A drift is a round piece of steel, made, in my experience, of one of the commoner tool steels, or perhaps one of the better wrought steels, shaped generally about six inches long, with a head, the shank being tapered from its outward end towards the head. In effect you have got a taper pin with a head on it. That drift is inserted by its smaller diameter end and by the means of a hammer, and forced in until you can get the holes as far as possible in alignment; at least into sufficient alignment that you can insert the rivet. By the use of such a drift you elongate both holes. You elongate, on the top sketch, the hole on the edge marked E; and you elongate the hole on the bottom plate at the point

marked F. That practice results in an oval hole, and disrupted material at the edge of the hole; and one effect that it causes, is to make a crack in the rivet. Because it is impossible, in my experience, to prevent such a crack, although it may be but a slight surface crack; and that means that that practice is universally condemned, and not permitted in any good class works, where they are building ships or building tanks. The use of a drift is precluded absolutely. Now if that hole had been reamed out, you would of course have to use a larger size rivet, or otherwise condemn the plate; unless you built up the hole with material, with welding, and then drilled a fresh hole right through the two plates.

Q. Now what does the rivet in this particular case indicate?

A. In my opinion, that it is a hazard to the tank, from the view of tightness.

Q. Now you have talked about reamering and drifting; can you determine whether either of those measures were followed in this case?

A. In my opinion it would have been impossible to get those rivets in unless the holes were considerably oversize, without the use of a drift. Of course the holes were not reamed because the same size rivet is there as in the other holes, and the centers are not in line. I think the appearance of the rivet heads here on the outside of the tank will show signs of heavy corrosion.

Q. You were going to complete this sketch by showing the rivet in the second hole.

A. Well you cannot get a rivet, unless it is very much smaller in diameter than it should be, and therefore a wrong rivet, into those holes without either reamering or drifting the holes. And with a drifted hole you force the rivet in in the way I will indicate in red.

Mr. Botts:

On the bottom sketch?

A. On the lower sketch. If the rivet—I show it in red, the rivet here, that is the snap-head, the original snap-head of the rivet, I mark G; the shank of the rivet I mark H extending from point J to point K. In red I mark the rivet head, head of the rivet. It will then be noted that the center of the riveted head is out of line with the center of the original head of the rivet before insertion.

(By Mr. Matteson):

Q. What is the position of the shank of the rivet with respect to the plates it passes through?

A. The shank of the plate—shank of the rivet, I am sorry, does not fill the hole perfectly, and is subject to stress with the returning of the material shortly after the removal of the drift and the insertion of the rivet, and you get a cutting edge placed on the shank of the rivet from the distorted hole. The hole is not fully filled even with a hot rivet; and that is why we always condemn the use of a drift in any good class work.

Q. Do I understand you to say that if the rivets were placed in as illustrated in the second part of the sketch, that in your opinion that rivet would or would not fill the hole?

A. It would not fill the hole up, and I think would be apt to add to the hazard of seepage or leakage.

Q. If the holes as prepared for the rivets are exactly opposite each other, how does the shank of the rivet pass through the plates, vertically or otherwise?

A. Well vertically or horizontally, it depends on the way you do the riveting. It passes through just like, more or less like a fitted bolt.

Q. At right angles to the plate?

A. At right angles to the plate, yes.

Q. And if the rivet is driven as you have indicated in the second part of this sketch, how does it pass through?

A. It passes through with a little less, depending on the way you look, a little less or a little more than right angles, whichever way you happen to see it. It doesn't pass through. And then you are apt to get the original head, the snap-head, at an angle which I will indicate here; at an angle to the plate. I will mark that spot as L,—an angle which I have indicated by the thickening of the red line in a wedged form. Is that clear?

Q. What would be the effect of that with respect to a gasoline tank?

A. A rivet fitted in that manner is defective and should be removed, and a new rivet put in when the tank is constructed. It is evident before construction, and the effect would be, in my opinion, to increase the hazard of wastage of the shank, and thereby add to the hazard of seepage or leakage.

Q. Now referring to this exhibit that we have been talking about, 6-A, how many of those heads are out of line in the manner that you have described, with the riveted heads on the opposite head?

A. I want to get the right-hand.

Q. Just a minute.

A. I should say two are definitely out of line; two at least. The two I refer to are the two to the left-hand side. It is very difficult to test,—make that test, on the rivets, in a vertical way. There may be some more that I would have to look—I think I will just check the heads that way; I check them this way easily. I am looking at the edge of the two plate and across the two heads of the rivets, so I can find out. Those two at least, in my opinion, have been inserted by means of drift.

Q. I refer to Exhibit 5-Z, ask you whether any of those rivets are out of line in the manner you described.

A. The riveted heads of these rivets seem to be in much better condition, in my opinion, than in the previous exhibit.

Q. What I was asking was, how many of them—or whether any of them are out of line as you have described?

A. Not to any noticeable extent. I can't notice any there that I can comment upon.

Q. I would like to ask you what you noticed with respect to these four exhibits, and with respect to soldering on the rivets on 5-X?

A. You apply—

Q. Whether the rivets are soldered.

A. I notice that the soldering of the seam has run up to one of the rivets and is attached to the head to the extent of about perhaps three-sixteenths of an inch of its periphery.

Q. Otherwise is there any other solder on the rivets?

A. I can find none.

Q. We are talking about the heads of the rivets; now how about the reverse side of the plate.

A. May I go to the window? (Witness goes to window.) There is a certain brightness on a part of the rivet, but I don't know whether it is the remains of solder or not; I couldn't say. I don't know whether that is solder or not.

Mr. Matteson:

I want to mark this drawing as an exhibit.

(The said sketch was admitted in evidence and filed as Libelants' Exhibit 151.)

Q. From your examination of the tanks this morning what did you observe with respect to any indication of solder on the side seams of the tanks?

A. I think most of the side seams were soldered up to—a distance I didn't measure, but I imagine possibly up to two feet from the bottom. But I noticed on, I think

it was on tank Number Three, that at least one of the vertical seams as I recall—I could find no evidence of solder on that seam at all. You are referring to solder on side seams only?

Q. Yes. Do your notes of your observations—

A. On the other seams I endeavored to find solder above the place I mentioned, two feet, and failed to find any indication of solder or anything that indicated that there had been solder there.

Q. And how close was your examination?

A. Well I made a fairly close examination, in view of the questions Mr. Underwood put to me in the evidence before.

Q. Did you find any evidence of discoloration?

A. I find none, sir; no discoloration; alongside the seams, that appeared to be the same discoloration that was on the surfaces, more or less general on the tank, and certainly some considerable distance away from the seam. I saw no difference in discoloration alongside the seam, that I did a distance from the seam.

Q. In your opinion, from your observation, had the side seams of these tanks been soldered at any time before the fire, above the point which you have mentioned, about two feet from the bottom?

A. Not from what I observed, sir.

Q. I have these pictures here now, Mr. Thompson; I show you this one. Will you describe what is illustrated by that picture?

A. This shows part of the top crown plate of one of the tanks—that is Number Two tank; and also the number of the tank, which is Number Two. It also shows a knife I placed in,—pocket knife that is, I placed in the circumferential seam just adjacent to the jointer hole. Am I allowed to mark this?

Q. Yes.

A. Which I will mark—jointer rivet, rather, which I mark as—letter A?

Q. Yes.

A. With this jointer rivet you have got three-ply riveting, and you get the overlap of the side plates, and the thickness of the crown plate. The rivet goes through three thicknesses and forms what we call a jointer rivet. The inner edge of the center thickness, which is the underside of the lap of the two side plates, should be thinned out by fire, to what we may call a feather or thin edge. My observation, that edge had not been fired to that extent, as it still had an edge of measurable depth, in my opinion, of a full sixteenths, square edge; and I should be glad to give you a sketch showing the effect of that.

Q. Well I think we can see from the picture all right Mr. Thompson.

A. In my opinion, as I say, that is not only bad, but unless you juggle the other plates,—that is the plate above, to overcome that thickness, you are going to get at least a pin hole through there. At that point I stuck my penknife in, as I did in practically all of the tanks in similar position, and I found a more or less equal condition—that is a condition in which I could insert my penknife to a considerable depth. By considerable depth, I mean an average of from three-sixteenths to nearly three-eighths.

Q. Well what is the importance of that, Mr. Thompson?

A. In my opinion, that that was not a tight joint even when manufactured. By tight joint I mean it would not prevent the escape of gases.

Q. In your opinion did the tank leak at that point?

A. Pardon?

Q. In your opinion did the tank leak at that point?

A. No, I should not say the tank leaked there.

Q. Because that would be rarely in the area of liquid?

A. That is at the top of the tank.

Q. I am not necessarily referring to liquid gas; what will be the effect of a condition like that on the top of the tank?

A. The tank would not be tight at that point.

Mr. Matteson:

I would like to have that photograph marked.

(The photograph so tendered, was admitted in evidence and filed as Libelants' Exhibit 152.)

Q. Now is there something else that is illustrated by this photograph, that you wish to call our attention to?

A. Yes, this photograph shows what I have referred to as the mixture of soap and water that was applied to the tank for the purpose of testing it by air. It further shows that this crown was poorly fitted in relation to the side plate.

Q. In what respect?

A. Insofar as the radius of the corner of the outside of the crown plate was not finished, when it reached the top of the outside plates; so therefore in my opinion it gave me an imperfect lap on the top of the tanks; that is, lap or seam between the crown of the tanks and the body of the tank.

Q. Well I am not entirely sure that I understand your last answer. Can you put it in simpler language, perhaps?

A. Can I make a sketch?

Q. If you can put it in simpler language, I would prefer it.

A. Well the space I mean is the—marked with a pen here or something?

Q. Here is a pen.

A. Sort of a small space; the space I mean lies all around the top of the side plating, between the points of

the two arrows marked B and C. That space—I think that is clear.

Q. Let's see if I understand it. The flat part of the crown of the tank, which might come in contact with the side plating of the tank, is placed so high that some of it does not—is that what you are saying?

A. No, it is so low. You see that briefly, from that I consider there would not be a good seam, circumferential seam.

Q. And what would be the deficiency in that seam?

A. I consider that poor workmanship in a tank, and that the seam would form a poor joint.

Q. Now passing to this next photograph, will you tell us—

Mr. Botts:

Get it marked first.

Mr. Underwood:

Better describe it first.

(By Mr. Matteson):

Q. Will you tell us what is illustrated by that photograph, to which you wish to call our attention?

A. Well there is a difference here between the two—between two outlet fittings, which I referred to earlier in my evidence on the stand.

Q. Now can you describe the photograph so we will understand what it is?

A. Well I am at a little bit of a loss, to be frank, about this photograph; I don't quite place it; I don't understand why this space should appear here.

Q. Well aren't they part of the two tanks, or all one tank?

Mr. Underwood:

Number Three and Number Four, isn't it?

Mr. Botts:

That is where we rolled the two tanks together.

Mr. Underwood:

It is agreed that this photograph taken this morning shows the outlet hole near the bottom of Number Three tank at the left.

Mr. Botts:

Number Two.

Mr. Underwood:

You are right, Number Two tank at the left, and Number Four tank at the right; the more or less vertical line in the center of the picture being between the bottom ends of the two tanks.

A. I would like first to call attention to corroboration of—

Mr. Underwood:

Put Number Two, with the pen, there; put here, Number Four tank.

Mr. Matteson:

Now will you mark that as an exhibit?

(Said photograph was admitted in evidence and filed as Libelants' Exhibit 153.)

Q. Now will you tell us your observations which this illustrates?

A. This confirms first what I said in relation to the non-water tight pitch of the rivets on the doubling plates. Shall I mark in each case?

Q. Yes.

A. Those rivets I refer to I will mark—

Q. A, B, C and D.

A. A, B, C and D, on the Number Two tank; and E, F, G and H on Number Four tank; and also to the fact that they are the same sized rivets as in the tanks generally; that is, they are five-sixteenths of an inch diameter.

Q. Now is there something else there you wish to call attention to?

A. I wish to call attention to the fittings. The fitting on Number Two tank is a different type of fitting to that on Number Four tank; that the outlets are appreciably different in bore; and it would indicate to me that the fitting on Number Four tank would require a further reducing piece for use as a fuel line discharge.

Q. You spoke of the possibility of a coupler having a flange that would fit against the tank. I call your attention to the coupler appearing on Number Two tank; did that have such a flange?

A. Not as I observed; and I don't think, on a round tank, that the fitting of another pad outside of the tank would be practicable. You don't screw it up tight on a round tank; you have to have a face to screw a shoulder on to, on a round tank. I further call attention to this, to other evidence, as to the wastage of the riveted heads of the rivets in Number Two and Four tanks, as comprised within the scope of these photographs.

Q. I show you still another photograph, and ask you to describe that, and tell us what it is?

A. This is a photograph of one of the side seams on Number Two tank; I will mark it "Number Two tank". This shows what I have already given evidence to, as to the bad workmanship which was present when the tank was built.

Q. Will you indicate that?

A. I indicate that by showing where the bad workmanship occurred; that is the cutting into the seam from

point A, and stopping suddenly at point B, when the mechanic was handling the shears; brought the plate back again into correct position under the shear. At point C it will be observed that the edge of the plate there, the point of the plate opposite point B, is practically up to the edge of the riveted head of the rivet; whereas in the remainder of the photograph generally it will be observed as at point D to E, that the edge of the plate is about half the diameter of the rivet away from the edge of the rivet. The depth of that cut from the proper edge of that seam, I measured to be—I know I measured it and gave it to Captain Patton, is that Number Two? Fifty-three seconds; and it was at this point, at point B I inserted the pocket knife to which I have already referred, and at which point my pocket knife went in for a full three-sixteenths. It was also at this, about this point, that I noticed several beads of water.

Q. Will you indicate approximately where you observed those?

A. For the full length of the seam as shown at certain places, and beyond—right and left, further along the seam, right and left as well, of what is shown on the photograph.

Q. What in your opinion did those beads of water indicate?

A. I have already given—leakage from the tank under the head of water that was in it. That tank was lying horizontally on the ground, and the head of water, in my opinion, would not have exceeded twelve inches—or half a pound per square inch pressure.

Mr. Matteson:

Will you mark this photograph please?

(The said photograph was admitted in evidence and filed as Libelants' Exhibit 154.)

Q. Is there anything else that you want to call to our attention in this photograph?

A. There are evidences here of cracked rivets,—rivet heads, not so badly cracked as I have seen in other places, but I will mark one if you wish. The rivet marked F; I also call attention to the fact that in these few rivets the alignment is extremely poor, showing in my opinion bad workmanship, either through drifted holes or through bad punching or drilling.

Q. I show you this other photograph and ask you what that is; please describe it.

A. That was the tank, the farthest tank; what was that one?

Mr. Munroe:

Number Three.

A. This shows the outlet near the bottom of Number Three tank. I will mark the photograph "Number Three tank".

Mr. Matteson:

Will you mark that one for us.

(The said photograph was admitted in evidence and filed as Libelants' Exhibit 155.).

Q. Is there anything on this photograph that you wish to call to our attention?

A. To shorten the record, I call attention to the condition of the heads of the rivets, and call attention to the outlet fitting—at least the hole; and that the rivets in the doubling plates are identical as I have mentioned it before in other photographs,—practically identical, the four rivets on the doubling plate. This particular fitting had a maximum of two full threads, with the attachment of

some cock or other fitting that came out of it. I used a pocket knife on the outer edge and the inner edge, and made bright,—the plates bright at those two points; I will mark those two points A and B. I did that because I wanted them to show up, and I could describe them much more easily. The distance between A and B, in my opinion, did not form, or could not form, a joint. Therefore in my opinion a joint at this particular fitting would solely consist of such a joint as you could make with two full threads in a fitting as I have already described.

Q. Well now Mr. Thompson, there has been some testimony here this afternoon that these two threads that appear there were made by a mechanic who was making the air tests on these tanks. So aside from those two threads, what is your opinion of the joint?

A. Well I didn't see any other evidence of what could have made a joint.

Q. What is this surface that appears between A and B? Is that part of the plate or part of the doubling?

A. Well I couldn't see inside of the tank, so all I can say, I don't think it is part of a plate. I couldn't see inside that tank; so I would rather not say what it is. I could only say I know it isn't part of the tank plate.

Q. Now generally speaking, from your observation of the tanks, some of which you have called to our attention, what is your opinion at this time as to whether they were suitable tanks for gasoline tanks?

A. Structurally I think they were quite suitable, in spite of the defects I have mentioned. But from tightness, I think that the tightness of seams and of rivets, I do not think that they were suitable for use for storage of gasoline at any time in their history. I am including in that, from the day they were first installed.

Q. When you said structurally sufficient, what do you mean by that?

A. I simply draw my observation of the section of the steel and the general construction of the tanks; I think

they would stand up under all pressures without deflation. In other words, a strong enough tank, but in my opinion they were not tight enough tanks. Since my observation at this time, I see no reason to change my opinion that they were structurally strong enough to stand up under all strains; but in view of the seepage, I consider that the evidence I gave last March I believe, that they were—that I was certain that seepage would occur within a period of—I believe, I stated four or five years as a maximum,—my opinion has been strengthened and confirmed by all that I have seen of the four tanks.

Q. Now what was your observation, Mr. Thompson, as to whether these tanks have been affected as to their tightness, or structurally, by the fire?

A. Oh, they were not distorted in any way by the fire. I don't think, structurally or from the view of tightness, that they were affected in any way by any heat that could have been applied to them there. Because we have vertical boilers of that type, which are regularly subject to heat, and furthermore not only heat, but concentration of stress, due to the inclusion of stay-bars, floor tubes or water tubes, that in my opinion, from a long experience with vertical boilers, I am quite satisfied that those tanks remained almost unchanged as the result of the fire. I would say that I have seen no signs on those tanks—any signs that they had been in a fire; but I don't deny that they have been. If I had to judge these tanks purely from what I see today, or of the tanks earlier, I have no evidence from the tanks themselves that they have even been in a fire.

Q. I refer to this exhibit 5-Y; is there something about that which you wish to call to our attention?

A. Oh; some particular thing? I call attention to a local lamination.

Q. Where does that appear?

A. Shall I mark the exhibit now?

Q. No, just describe it.

A. It occurs on the outer plate, that is the tank plate, at a point approximately half an inch up from the bottom, and nearly at the inner edge of the tank side of the plate.

Mr. Botts:

What exhibit is that now, please?

Mr. Matteson:

5-Y.

Mr. Underwood:

What did you call it?

A. A local lamination.

(By Mr. Matteson):

Q. What is a local lamination?

A. A local lamination is the thing that we frequently get in steel plates and is one of the causes whereby we take precaution to see that the seams are made tight by welding; and the rivets are made tight, to overcome this weakness which may appear or may not appear during the course of construction. These laminations frequently don't turn up for some time; that is, don't turn up,—they are not noticed during the course of construction; but I have seen them occur in boiler furnaces years after—not occur, to the observation of them, considerable years after the boilers were made. They are in my opinion caused by the inclusion of a small piece of slag, or by other things, in the course of the construction of the plate,—that is, the manufacture of the plate. That thing may be discovered during machining, and the imperfect part, or the lamination, pulled out, during the cutting process or other processes of manufacturing. The effect is that if you get such small laminations in a tank,

particularly in the seam, they are not discoverable; they form added hazards and undiscoverable hazards; lasting effects, if you like, which have to be provided for; and one of the known hazards in the construction of steel vessels. We overcome the risk of that hazard in steel vessels by caulking the plate on the water side. I think it is incidental to the manufacture of mild steel plates, and cannot be done away with. One has to take every precaution to overcome the hazards that arise from such an error or trouble in the plate.

Q. What are the precautions they take?

A. Normally, a small imperfection, as is shown there in the body of a tank, away from a joint, is you might say no moment. But if a fault like that occurs in a seam it is apt to cause that seam to become other than tight; and to overcome that hazard we weld the edge of the plate and the rivets, where any dangerous fluids are to be carried. I think that is the only observation I can make on that.

Mr. Matteson:

That is all.

Cross Examination.

By Mr. Underwood:

Q. Mr. Thompson, look at Exhibit 5-W.

A. Yes, sir.

Q. Do you notice the four bright spots on there?

A. Yes, sir.

Q. Apparently made with a wire brush?

A. Undoubtedly made by a wire brush, I should say.

Q. What is the grey colored material exposed?

A. In this case I should say it is the wire brush; that is the case on the top right-hand corner.

Q. How about the other three?

A. I should say the same applies to the lower right-hand corner.

Q. Well is that or is that not the original galvanizing, in your opinion, that is exposed?

A. In my opinion, sir, there are just particles of galvanizing left in all corners; most of those are marks left by the wire brush.

Q. You see particles?

A. Just particles.

Q. What is the shiny grey stuff you see?

A. Wire brush mostly, sir.

Q. You mean, particles of the wire brush adhered?

A. No, sir; the same kind of thing as if I do any part of a rusted plate, with a wire brush, that is what we get after wire brushing plates, if the plates are not galvanized.

A. I say the grey stuff there is the marking from a steel brush.

Q. You mean, part of the steel brush has worn off on the—

A. Apparently are the marks set up,—the rubbing you get on any steel plate from the use of a steel brush. That appears regularly on brushed surfaces.

Q. Don't tell me what you have regularly done; I am asking this particular question and I want an answer to it. What is the grey stuff, is it steel, is it the original steel of the plate, steel left there by a steel brush, or what is it?

A. Steel brush, a part of the original appearance of the plate, if you want a complete answer, I should say.

Q. I call your attention to the edge of Exhibit 5-X, part of the portion of the vertical plate; do you notice the rust on there?

A. Are you referring to this here, now?

Q. Yes, on the edge.

A. Yes, that appears to be rusted there.

Q. Why did that which was cut on Monday, rust where there could never have been any galvanizing, where these exposed surfaces on Exhibit 5-W, which were cut on Saturday, did not rust?

A. I couldn't tell you, sir.

Q. Isn't it a fact that the galvanizing on there is what kept it from rusting?

A. I do not agree. I do not agree, absolutely. No question about it.

Q. Do you say, Mr. Thompson, that because the fitting in these tanks varied, they necessarily leaked?

A. No, sir, that was not my testimony at all.

Q. Did you say that you observed no soldering whatever on the vertical seams of these tanks?

A. Oh, no, that is not my testimony.

Q. You did observe soldering to about eighteen or twenty-four inches up the vertical seams of some of them?

A. I think most of the seams were soldered; that is my testimony. I referred to one seam only.

Q. Did you observe any difference in the soldering at those seams, at the upper ends?

A. I believe in one case, or perhaps more, I noticed that the solder—I don't know whether it was high up as twenty inches; but I will say this,—I saw a difference in the soldering on at least one of those portions you refer to.

Q. Isn't it a fact that the upper end of the portion which now shows solder, shows more solder than it does at the lower portions?

A. Yes, in one case.

Q. Isn't that true generally?

A. No, sir, I wouldn't agree with you as to that generally.

Q. Where do you suppose this extra lumping of soldering came from on the one you speak of?

A. Oh, I should imagine that it ran down, with the heat, from that upper portion.

Q. Do you mean to say that you observed no evidences of solder remaining on the vertical seams near the top of the tanks?

A. I did not observe it, sir. I looked for it especially and I couldn't find it anywhere. I thought that that question would be put in Court, and I looked for that.

Q. According to my notes you said the tops of all the tanks had openings at the lap. Do you mean, openings through which you could insert an instrument right out through into the tank?

A. Oh, no, sir, I didn't say that.

Q. You don't refer to that type of opening?

A. Oh, no. I think I described it, and offered to make a sketch to illustrate it. But I didn't describe it that way at all.

Q. And you didn't mean to convey the impression that where you put your knife in, you could put it all the way through into the tank proper?

A. No, sir; because I gave you the actual depth the knife went to; which was less than the depth of the seam. I might also say Mr. Underwood, that—

Q. Have you answered my last question?

A. Yes, sir, and I would like to make comment, if you don't mind.

Q. If you want to amplify your answer, I have no objection to that.

A. Well amplifying my answer to the very point you have just raised.

Q. Of course you may answer my questions fully.

A. Well I think—you are referring to openings I observed with my knife; and I wish to amplify that answer.

Q. Go ahead.

A. I say, I inserted my knife in various places on the side seams,—the blade of my knife, in several places, to

a depth two to three-sixteenths, on all the tanks. I tried every tank with my knife, on the side seams.

Q. And by that depth, do you refer to openings clear through into the tanks?

A. No, sir; I refer to the opening I described.

Q. Let's get it straight on the record: do you say that at any point you could put your knife through the seam so that it came out at a point inside the tank?

A. No, sir; I never discovered any such place.

Q. So that the places where you could put your knife, do not necessarily indicate leaks; is that correct?

A. No, certainly not. I am just describing what I found. I am not referring to leaks, I was referring to what I found,—physical facts.

Q. Mr. Thompson, have you ever been told that one of the purposes of cross examination is to clear up any lingering doubts in the mind of the cross examiner?

A. No, sir, I don't believe I have been told that.

Q. Will you please assume that. You observed, I take it, a bulge in the bottom of only Number Four tank?

A. That is right, the only one I observed.

Q. Well, isn't it a fact that the other three were not bulged at the bottom?

A. Yes, I think I will agree to that, sir.

Q. Do you consider Mr. Thompson, in the situation of these tanks, exposed to the elements, after the superstructure of the Seminole had been burned away, it was a favorable condition to their preservation, or an unfavorable condition?

A. I should say, unfavorable. That is contrary to what Mr. Gibbs said, that the rust protects them.

Q. Do you think they, in that situation, would have corroded some?

A. I should say they did, definitely so.

Q. Do you say that the condition of the plates, and the rivets in the tanks today is any fair criterion of their condition in the boat just before the fire?

A. May I have the question read? (The question was read by the reporter.) Oh, I think reasonably so, yes, sir.

Q. In what respect?

A. That I don't think that the space from the top of the tank, I refer to, is any greater now, appreciably greater; I don't think—

Q. Just before you go any farther, Mr. Thompson, I would like to know just which space you mean. Between the crown and the vertical plate?

A. That is right.

Q. All right, now go ahead.

A. And all the remarks I have passed as to the jointure rivet, I think that is the same, because that was their construction.

Q. Of course there haven't been any structural changes?

A. No. I think the distance between the outer edge of the overlap of the vertical seams, and the body of the tank, would be approximately the same today; that condition which I noted with my pocket knife, I think that all the cracked rivets that I observed there were the same,—practically the same.

Q. You mean you think all the rivets that are cracked now, were cracked before the fire?

A. Yes.

Q. You don't think that the effect of the elements in the intervening four years, has had anything to do with that?

A. Not with the cracking, sir; no.

Q. You don't think it would be possible that the fire had anything to do with that?

A. Certainly not.

Q. You think they were cracked from the beginning?

A. Absolutely, in manufacture.

Q. From the day they were riveted?

A. From the day they were riveted; that is my evidence.

Q. And what percentage of the rivets in these tanks do you think are cracked now?

A. Well, merely a guess; I wouldn't be able to give you a fair figure, Mr. Underwood. I said, a considerable number.

Q. Would you say five or ten percent, two percent?

A. Oh, that is not a fair question. I wouldn't care to go on record, it would be the wildest guess, as to percentage.

Q. Isn't it a wild guess too as to when the cracks occurred?

A. Not at all, sir; not a guess at all. That is evidence based upon my experience, and no guess whatsoever.

Q. Do you say that from your experience you can express an opinion with any degree of reliability, as to whether or not a crack existing today, existed in 1922?

A. With absolute certainty; no question whatsoever.

Q. Where does a rivet head begin to waste?

A. Where it is affected by the elements of wastage.

Q. Suppose the whole rivet head is affected by the elements, where does it begin to waste?

A. Well I don't think I could give you any particular spot; I should think, generally,—on the whole; that is my experience. It would depend upon how many rivets were driven home, if you have a crevice inside or out, which is apt to collect moisture and retain it, probably the wastage will be more observable there than in the body or the head.

Q. You think wastage will occur at the edges more quickly than at the heads?

A. You are assuming a perfect head—

Q. A sound rivet.

A. I think if that were driven well home, I think the surface that was exposed to the elements that cause rust, would have an equal effect. If on the other hand the head were not driven well home, I think the periphery

of the rivet would show the biggest signs of rust. That is a complete answer.

Q. Those rivets are driven hot, aren't they?

A. I have never had a five-sixteenths riven driven hot, in my life. We never dream of driving a five-sixteenths rivet, driven hot; we use softer iron in England and drive a five-sixteenths rivet cold.

Q. You assume in your testimony that these rivets were driven cold?

A. No, I haven't mentioned anything about it. My opinion is, from the appearance of the rivets, that they were driven hot. I don't think I stated anything about whether the rivets were hot or cold.

Q. What I am asking you, Mr. Thompson, what is your judgment on that point,—that the rivets were driven hot or cold?

A. In my opinion the rivets in that tank were put in hot.

Q. Now in ordinary practice, when rivets are being driven hot, what color are they when they come out of the forge? Call them cherry or white, or what?

A. When they come out of the plate in which they are inserted—come out of the forge?

Q. Out of the forge.

A. The same way with a rivet there, in my opinion, they are approaching between—the range between cherry hot and white hot, somewhere in that range.

Q. So they are inserted—

A. Please don't forget, they vary according to the temperatures and the attention of the riveter.

Q. Assuming they are driven—usually passed one by one, and driven as they come from the forge, aren't they?

A. Oh, no question about that; they are thrown to the holder-up, by the rivet boy; the holder-up inserts the hot rivet in the hole, and he uses his Tommy bar and drives that rivet through the hole.

Q. Mr. Thompson, I don't mean to cut off your answer.

A. My answer is full.

Q. If you will just confine your answer to my question, we will get through here a lot more quickly. Now the rivet flows when it is driven, to some extent, does it not.

A. It would have to be delivered very, very quickly from the forge, to flow. By the time it gets to the rivet hole it is by no means white; it is approaching at that stage a cherry stage.

Q. A hot rivet head changes its shape under the force of the hammer, does it not?

A. You mean, the original rivet head?

Q. I said, the rivet head.

A. There is no rivet head there until it is riveted.

Q. Do you say that the process, by the force of the hammer, changes the shape of the rivet so it assumes a head on the other end, does not have any effect in shortening the shank of the rivet in the hole?

A. You happen to be asking me questions I don't know anything about, Mr. Underwood.

A. I am glad I have found one subject on which you do not. Now proceed to answer, will you?

A. They are shortened?

Q. That is the question.

A. Well if it didn't, it wouldn't hold the plates together.

Q. Now you have spoken about these plates where the holes don't overlap properly.

Mr. Botts:

I want to be excused a few minutes, because I have to tell my folks where to meet me.

Q. Isn't it a fact Mr. Thompson, looking now at Libelants' Exhibit 151, that a rivet such as you refer to

on that drawing would be driven into the corners, and fill up the space?

A. No, sir.

Q. You say, not?

A. Definitely so.

Q. What would keep it out?

A. The fact that it is not molten enough. If it did, that rivet is so much the worse, because you would have a definite neck in the shank of the rivet; and if it is suggested that that was what happens, that rivet is so much more the worse.

Q. In other words, if it fills up that space, it is worse than if it does not, is that what you say?

A. That is true.

Q. Which, in your opinion, is the stronger rivet; a cold rivet or a hot rivet, in such condition as these tanks?

A. Cold riveting.

Q. You prefer the cold?

A. Undoubtedly; unquestionably.

Q. Is a hot rivet any different in size than a cold rivet?

A. No; the rivet has a relation to the diameter of the hole; it doesn't matter whether it is hot or cold.

Q. Well does a piece of steel, a rivet for example, get any larger when it is hot?

A. Oh, yes.

Q. And then when it cools off it gets smaller, doesn't it?

A. That is right, yes.

Q. Isn't that what pulls your plates together and holds them tight, the shrinkage of the rivet?

A. I hope not.

Q. In your opinion that isn't it?

A. No, sir; I hope no one depends upon that type of rivet. If it is suggested that type of riveting is done in this tank, it was poor riveting throughout. Hot riveting

should be followed up every five or six rivets, as Mr. Gibbs knows quite well.

Mr. Underwood:

I move to strike out what this witness says Mr. Gibbs knows.

A. You follow up every fifth or sixth rivet.

Mr. Underwood:

Now read that last answer; I didn't get it.

(Preceding testimony was read by the reporter.)

Q. Now Mr. Thompson, do I understand clearly or correctly that you say the rivet should not contract after it has been driven together in the hole?

A. Should not? It does contract. Contraction of metals—certainly it contracts; it contracts both ways.

Q. Well should a rivet be under tension when it is driven—after it is driven?

A. I am afraid I don't follow you. It is under tension undoubtedly until it cools off; that is why we need a follow-up.

Q. How about after it cools off?

A. We then follow-up.

Q. No; it is under tension after it cools off?

A. It is under tension until it has cooled right off.

Q. After it has cooled off, cold, it is no longer under tension?

A. It certainly is when the tank is in operation, under movement; every rivet is under tension, undoubtedly.

Q. Just assume two plates, standing up in the yard, and you want to rivet them together,—nothing else but two flat plates; and you drive rivets in them, hot; are they under tension after they are cooled off?

A. Certainly they are; tension all during the life of the rivet. When they get out of tension they are no longer rivets. Most decidedly they are.

Q. Then why do you follow up?

A. I have done riveting myself—

Q. I didn't ask you that.

A. And I know that a hot rivet cannot be satisfactorily tight unless it is followed up; and men who are paid so much a hundred for rivets would not go to the extra trouble of following up unless they are forced to, because it means additional labor on their part; they are paid so much per hundred rivets.

Q. Does the riveter do the following up on his own rivets?

A. Unquestionably. I thought you had been advised; otherwise I would say that is a foolish question.

Q. Did you say that you have not discussed the line of your testimony this afternoon, before testifying?

A. I just had a few words with Mr. Underwood—with Mr. Matteson; and I have not discussed what I was going to say.

Q. You have not discussed with Mr. Matteson except beyond a few words, what you were going to say this afternoon; is that right?

A. What I pointed out on the pictures, as I did to Mr. Botts and to Mr. Dyer; but we have had no consultation as to what I was going to say this afternoon. I didn't know what I would have to say. Mr. Matteson is here.

Q. Did you observe the size of the doubler plate around the outlet at the bottom of Number Four tank?

A. I looked at it, so I must have observed it. I didn't measure it Mr. Underwood.

Q. Do you know what relation its size bears to the thickness of the side plating of Number Four tank?

A. Do you mean, the relation to the thickness?

Q. Yes.

A. I didn't measure it. I should say it is thicker, quite considerably thicker than the side plating of the tank; but I didn't measure it, Mr. Underwood.

Q. Have you any opinion, Mr. Thompson, looking at Exhibit 5-X, as to whether the shanks of those four rivets have been affected by corrosion or rust?

A. You mean, the shanks inside the holes?

Q. Yes.

A. No, I couldn't say.

Q. Is that true of the other two segments of the bottom seam?

A. I think, as to what one would call the shank of the rivet, yes. I think that is true.

Q. Mr. Thompson, I take it that this Exhibit 151 was intended in a general way to represent the lap between the side plating and the bottom crown of the tank?

A. No, sir, it was just a hypothetical case, indicating the effect that would be experienced from holes that don't come opposite one another. I didn't refer that to the tank at all, it was a hypothetical case.

Q. Mr. Thompson, this Exhibit 155 showing an outlet hole of Number Three tank:

A. Yes, sir.

Q. What do you say the material or the piece marked B. is?

A. I don't know; I didn't ascertain that. I couldn't give you an answer.

Q. I am not asking you whether it is made of steel or brass or copper or anything of that sort, but whether or not it is part of the doubler plate or part of the original side of the tank, or what it is.

A. I gave evidence that in my opinion that I was quite certain it was not part of the side plating.

Q. Can you say anything more about it?

A. No, I couldn't say more than that. I do say the space doesn't form a place for a joint, that is all.

Q. I refer to what it is. You can't say whether it was part of the doubling plate, is that right?

A. No, I couldn't say; I don't know what it was; I didn't note that. I couldn't get inside that tank, and I was not satisfied my evidence would be good on that point.

Q. Do I understand you to express an opinion that these tanks leaked from the very beginning?

A. No, I didn't express that opinion.

Q. Did you testify that seepage would occur at any particular length of time after they were first manufactured?

A. I think I did, in March; I think that I expressed—

Q. I am just talking about your testimony today.

A. No.

Q. Do you have any opinion as to how soon after the manufacture of these tanks, seepage would begin to occur?

A. No; I think I am satisfied with what I have already said.

Q. I am sure you are, but I want to know whether you have any opinion on that point.

A. I haven't thought it out, Mr. Underwood, and I wouldn't care to give a jump decision.

Q. That is to say you at the moment have no opinion as to when these tanks would begin to show signs of seepage?

A. I am not prepared to express one, sir, only as far as in my opinion it would be in the early stages; but without giving it due consideration,—and even then I don't know that I would care to say a definite date; I don't say that.

Q. Well did you understand the question that I was asking you?

A. I don't know, a definite period or a certain period; I say that I would not have been surprised if they had shown seepage right from the day they were put in. I will go that far, I wouldn't be surprised. I haven't expressed an opinion as to any period.

Q. Well have you expressed an opinion today as to whether these tanks leaked on the day of the fire or prior to that time?

A. No, I don't think I have today, Mr. Underwood? If you turn to your notes, —I don't recall that.

Q. Do you say that they leaked at that time?

A. No, I haven't said that. I don't know that they ever had gasoline in. I don't know anything about those tanks in fact.

Q. You have no opinion as to whether they leaked on the day of the fire or prior to that time?

A. No, I haven't expressed any opinion. I have no evidence myself that they actually contained gasoline. I don't know what they are.

Q. Of course you understand, Mr. Thompson, I am not asking you the question from the point of view of observation, because you never saw the tanks before the fire?

A. No.

Q. You understand I am asking you whether you have any opinion on that subject.

A. I don't think I have one now as to any particular period. I have gone as far as to say I wouldn't have been surprised, from what I have observed of the tanks today, and their construction, that they may have seeped from the very day they were put in. I can't go beyond that, and that is going a long way, in my opinion.

Q. You mean they may not have leaked or seeped in their life, up to the time of the fire?

A. That may be so, but I would be very, very surprised, from the whole of my experience.

Q. Did I understand you correctly to say that the tank showed no signs of distortion by fire?

A. In my opinion, they did not.

Q. They don't show any effects of an explosion?

A. No, I didn't observe any effect that I would put down to an explosion of fire whatsoever, Mr. Underwood.

Q. You think they came through the fire physically unscathed, do you?

A. Well I see no signs pointing to the reverse of that.

Q. Did you notice any effect of fire on the zinc on the tanks, anywhere?

A. Zinc on the tanks? You mean, the galvanizing on the tanks?

Q. Yes, galvanizing, if you like.

A. I didn't see. Whatever particles of galvanizing, or whatever particle I would consider would be what may be left of galvanizing, I didn't notice any effect of fire on those particles at all; no. I say, I didn't notice the effect of fire on any part of the tank. That will include what you allege to be particles of galvanizing. I saw no effects on any part of the tank.

Q. Examine Exhibit 5-X, Mr. Thompson.

A. Yes, sir.

Q. And tell me whether you see any effects of corrosion on the inside.

A. Effects of corrosion inside? As far as I can see: I can't see the seam, you see.

Q. As far as you can see.

A. These have been cleaned off. I should think there has been quite a lot of rust taken off these tanks, and I see the effects of corrosion all along the curvature of that seam.

Q. And how deep do you say that effect goes?

A. I do not know. I have never said the structural strength of these tanks was affected beyond what the tank was able to carry out fully all it was called upon to do in that respect, structurally. You asked me; I say, I see definite signs of corrosion there, and these plates have

been cleaned in a way that tanks are fully cleaned once or so a year, and protected by paints thereafter.

Q. How deep do you say the effects of that corrosion go?

A. I couldn't say, sir.

Q. I would like your best estimate, Mr. Thompson, of the depth of the effect of that corrosion?

A. I couldn't tell you, sir. I don't know what the origin of that plate was. This plate has been very carefully cleaned with wire brush, and I haven't the slightest idea. If you would show me that plate as it came out of the tank, you would have given me an opportunity to answer the question in an intelligible form. Now you present an exhibit to me that has been altered.

Q. Well now suppose you assume that the thickness of the plate originally was as thick as the vertical side plating now is at the top of that piece.

A. Well there is an edge on the top of that side piece already; you have to take that edge off before I can give you that answer. There is already an edge on the top, that apparently gives a thicker side plate, and so you would have to alter that.

Q. Is it fair to say it is approximately a three-sixteenths plate?

A. Yes, I think so.

Q. Now assuming that the plates were originally three-sixteenths plate, how deep has the effect of corrosion gone in that crevice?

A. Not enough to affect the structural strength of the tank.

Q. I want a measurement.

A. I can't tell you. I can't measure in that way at all; I couldn't tell you, Mr. Underwood.

Q. A measurement in a small number of thousandths of an inch; would it not? Just answer the question. (The question was read by the reporter.)

A. A small,—what do you mean by a small number?

Q. Of thousandths of an inch.

A. What is a small number of thousandths of an inch?

Q. Three?

A. I couldn't say without trying it out with calipers.

Q. Have you any calipers here?

A. No, I haven't.

Q. You decline then to make an estimate of the depth of the corrosion effect?

A. No measurement. I will admit this, that the corrosion, to whatever extent it was, has still left an appreciably strong plate.

Q. And do you see any signs in that joint of corrosion having affected the inside of the seam, so much as you can see of it?

A. I can't see any of it inside the seam, sir.

Q. Then you can't say whether it leaked or not, can you?

A. Oh, no. I couldn't say that, certainly not.

Q. Now when you observed the bottom that had been cut off from Number Four tank,—you didn't observe that today?

A. Oh, yes, I stood inside of it.

Q. A great portion of that had not been cleaned with the wire brush, had it?

A. No, but I formed the opinion that it had been swept out. I formed the opinion that quite a considerable amount,—that is merely an opinion, because I was not there when it was taken off; that an amount of rust had been taken off, swept off; and I noticed quite a lot of rust had accumulated in the V-section. In fact I noticed an amount that was brushed up yesterday, by His Honor—or by someone for His Honor; I don't know whether it was Mr. Munroe. The crevice was almost filled with loose rust.

Q. Assuming that the tank had been subject to rise and fall of water within it at some time,—muddy water, would you expect to find that the mud would protect the plate from corrosion or rust?

A. No, sir, I wouldn't.

Q. Would you expect the process of rusting to go right on?

A. Apparently so. Yes, it would go on, I think.

Mr. Underwood:

I think that is all.

Re-Direct Examination.

By Mr. Matteson:

Q. Mr. Thompson, some references have been made to the significance of your observation, as to your ability to stick a knife point into the side seam of some of the tanks to a distance that you mentioned, and into the top seam. I want to be clear as to just what the significance you do attribute to that condition, is?

A. I think that is a poor seam, sir; a poor joint. I consider it was a poor joint.

Q. Why does that indicate a poor joint?

A. Because the two plates are separated; allow a space between the plates.

Q. And a good joint, would the two plates be in contact with each other?

A. Oh, absolutely.

Q. Why is it that you say it is customary in riveting, to follow up every fifth or sixth rivet?

A. To be quite sure that the head of the rivet is firm up against the plate on the inside; that the finish of the outside—that that rivet in a cold,—semi-cold state, is properly finished and closed on the plate on the outside. Because all riveting, paid by the hundred rivets, is checked

up by a separate checker, who tests from the inside, the looseness,—or rather tightness of the rivet, to see if that rivet is loose. If that rivet is loose, that rivet is marked on the outside with a chalk mark, which means that rivet has got to come out, and is not included in his hundred; he has to renew that rivet.

Q. What is accomplished by following up every fifth or sixth rivet?

A. The tightening of the rivet, and the guaranteeing, more or less, of the tightness of the head against the inside plate, and the tightness of the head against the outside plate. There you have the rivet not red-hot by any means, it has cooled off rapidly in the atmosphere, and from appearance it looks dead cold. I admit it is not dead cold then. But you get the advantage, to a certain measure, the advantage that we get in cold riveting. And that is invariable, the practice in all the yards that I have ever been in, both here and in England and Australia.

Q. Now referring to Exhibit 151, your drawing, you refer to that as purely a hypothetical case?

A. Yes, sir.

Q. Was that intended to illustrate your testimony with respect to the conditions you found on the Seminole tanks?

A. I think it was in connection with one of the exhibits here, wasn't it?

Q. Well you were referring to a riveted plate.

A. Yes, but in connection with a particular exhibit here, where I found the centers of the head—I think that is some exhibit number; one that Mr. Underwood produced, I think.

Q. The point I just want to be clear, Mr. Thompson:

A. I didn't observe that on the tank. I observed that on the exhibit.

Q. Well now the point I want to be clear about is this: that wasn't intended to be a drawing of any particular rivet on the exhibit?

A. Oh, no, sir; purely an illustration of what I was trying to give in evidence; to clarify what might not have been clear by the words I used.

Q. Taking one of these exhibits, 5-Z, it has been testified here that this section of the tank, after being cut out by burning, that the sides were trimmed with a power hack saw. What would be the effect of that on the exhibit?

A. In my opinion, to close over the steel on the inside of the seam, from both plates.

Q. If there were rust or corrosion present in the seam, what effect would that have on the appearance of the exhibit?

A. I think that would prevent one from looking into the seam and discovering and testifying as to what the extent of the corrosion was.

Mr. Matteson:

That is all.

Re-Cross Examination.

By Mr. Underwood:

Q. Are you saying, Mr. Thompson, that the effect of a power saw would be to force particles of something or other in between the edges of the two plates on Exhibit 5-X, so that you couldn't see the seam?

A. I think the effect would be to close up the seam, in other words, so I could not observe the appearance of the seam between the two plates.

Q. Of course you couldn't see the appearance of the seam at all if it weren't cut off, could you?

A. Oh, no.

Q. You could see the burned edge?

A. Yes.

Q. You could see a lot better this way than with a burned edge?

A. You get a fused metal, those flat exhibits; you just get a burned mass, with the plate destroyed, as I have already said that a burning tool or welding tool, particularly burning tool does destroy the edge of a plate.

Q. What does a power hack saw put into the space between the two plates?

A. I haven't said it put anything between the plates. It closes the metal over to the extent that it has put an edge on the side here, and an edge which the man referred to. You asked that question; you said he cleared off with his file. You can see here where he hasn't completely filed it off.

Q. It would have the same effect where the two plates are in contact?

A. For anything that were an absolute dead fit, you wouldn't, because there would be no space for that to go; but the effect on the exhibit itself, the outside of the plate, is what I refer to.

Q. Will you draw a sketch, please, of the upper crown of these tanks?

A. I will, with pleasure.

Q. Showing where the knife was put in. I don't mean any particular plate; just to illustrate your testimony.

A. Do you refer to where I put that knife, as in this photograph?

Q. No particular point, but a general illustration of your testimony on that point; the shape of the two plates.

A. Well I don't know more than one place, but I will give you the one. Here is—of course this is a much smaller radius than the tank is. Will that be good enough?

Q. We will assume that this is not to scale.

A. We will assume that it is not to scale. I will have to use two colored leads, I am afraid. Then we get—now to illustrate this, probably I will have to assume that I have cut off the top of the plate, the crown plate, to a position where it is opposite.

Q. Perhaps you haven't understood my question, Mr. Thompson. What I would like is a vertical cross section.

A. Vertical, that will illustrate only one thing; a vertical cross section will not satisfactorily explain what I mean. I will give you both. Here is the vertical plate.

Q. Mark it V.

A. This is marked V; I think you said V?

Q. Now the crown.

A. Crown plate; it is not to scale, Mr. Underwood, please note. It comes down here and forms the C. This is the similar sketch that I proposed to make earlier, to describe what I meant by the space.

Q. Now mark the crown with the letter C, please.

A. Mark that C.

Q. Now indicate with an arrow—the points of an arrow, where you put your knife?

A. I can't do it on that sketch, that is the point I am getting there, on that particular spot where my knife was in. I have to give this plan to give that.

Q. That is one thing I want to get clear, Mr. Thompson.

A. I will give you another sketch, so I think I can partly—

Q. Just a moment please. Do you say now that you did not insert your knife down between the top edge of the vertical plate and the top crown of the tank?

A. Top edge—apart from the joint?. I did, in several places.

Q. Can you indicate on there where you did?

A. Well this is not to scale. I did it in between here, where my knife went down. Now this is not to scale;

down in there, beyond where the round of the top plate had finished.

Q. Draw an arrow and mark it, Knife.

A. Knife blade; and I will put it in a wedge shape, and I finish the edge at a point where it goes below the turn-in, and I will mark that—what? K?

Q. K, for knife.

A. Okay. No, I want that for Point; K means knife point, and K-1 is the remainder of the blade, or part of the remainder of the blade.

Q. As you like.

A. All right.

Q. Now draw the rivet in there.

A. Oh, I have not made this in scale. I will draw a rivet in there; there is the rivet hole, here is the rivet. That is the top plate, and the inside, I presume, in that tank, had the same kind of head as they had on the others; that is a snap-head. Not to scale. Shall I mark that Rivet?

Q. Mark it R.

A. Mark the head,—the rivet?

Q. Either one. Now do you say that your knife blade went down to the rivet?

A. No, I didn't say so, sir.

Mr. Underwood:

I offer that.

A. I did not say so; I don't know how wide it was; I couldn't tell you. As a matter of fact that was put in between the rivets, and not on the rivet.

(The said sketch was admitted in evidence and filed as Respondents' Exhibit 6-B.)

Mr. Underwood:

That is all.

Mr. Matteson:

I think that is all.

(Witness excused.)

(At 6:00 o'clock P. M., the hearing was recessed until 7:00 o'clock P. M. of the same day, to-wit, November 21, 1939.)

Evening Session.

November 21, 1939, 7:08 o'clock P. M.

4383 Thereupon J. N. PATTON was recalled as a witness on behalf of Libelants and further testified as follows:

Direct Examination.

By Mr. Matteson:

Q. Captain Patton, you observed the gasoline tanks from the Seminole at Warriner's Yard last night, and in company with Court and counsel, did you?

A. I did.

Q. Did you observe them there again this morning?

A. Yes, sir.

Q. I mean, the tanks.

A. Yes, sir.

Q. And will you outline to us what you observed with respect to the tanks?

A. The first thing I observed was that lamination about an eighth of an inch deep, in Number Four tank; an indentation.

Q. Will you describe that to us, Captain?

A. It was just an indentation in the steel.

Q. About how long?

A. Oh, I should say an eighth of an inch long and an eighth of an inch deep.

Q. That was in what tank?

A. Number Four tank; the first tank I examined.

Q. That was in the side of the tank?

A. Yes, sir. The next thing I observed was, that the riveted seams were not in line, casting my eye on them, they were kind of staggered; some rivet edges were nearer the seams than the others.

Q. Are you referring to Number Four tank?

A. Yes, sir.

Q. And what did that indicate to you?

A. Well, a poor riveting job, I should say.

Q. All right.

A. I observed the bottom piece was—there was two pieces about seven inches by eight inches, cut out of the side of the tank, and the bottom cut off. Near the remainder of this Number Four tank, where the bottom had been cut off, I observed three rivets that were very badly corroded,—that is, on the outside. Then in that—what do you call that piece inside of the tank?—The doubling piece, that was somewhat thicker than the shell plating of the tank; and four rivets in that,—four five-sixteenths rivets, from center to center was two and seven eighths inches.

Q. What is the significance of that?

A. Well that would hold this doubling piece on the shell of the tank; and these particular tanks, the fittings, were screwed into that.

Q. You speak of the rivet being two and seven eighths inches apart?

A. Center to center.

Q. What importance did you attribute to that?

A. Well I thought it was too wide apart to make a water-tight joint there, or a gasoline joint. That's pretty far, for that sized rivet, from center to center.

Q. All right, what else did you observe?

A. In the top of the crown of the tank, of course a little space before the flat of the lip part of the crown flattened,—I think I could draw that better than I could explain it.

Mr. Underwood:

The space between the crown—

A. I say, the side lip of the crown, the curve, made quite a V space between that lip and the shell of the tank; so that you,—in spots you could insert the blade of a knife in for some little distance.

Q. What is the importance of that?

A. Well my opinion, that that entire flat part of that side lip should be flat surfaced against the shell of the plate.

Q. And the fact that you observed something different, what did that indicate about the tank?

A. Well I don't think that the tank was properly—the crowns were properly put in,—riveted.

Q. All right, what else did you observe?

A. On this tank it was about twenty inches of solder at the foot of it, but no evidence of solder on the rivet heads for the rest of the seams; none on the top.

Q. Do I understand that above the twenty inch space at the bottom where there was solder, you found no evidence of solder in the side seams?

A. No, sir.

Q. In your opinion had that seam above that point ever been soldered?

A. No, sir, I don't say so, in my opinion. I also observed that there was two rivets burned out of the seam.

Q. Two had been burned out?

A. Two had been burned out, yes, sir.

Q. What did you observe about that?

A. Well in the one at the head of the tank I observed that one hole, in one sheet, was staggered from the hole underneath it; that is, they didn't line up.

Q. What is the importance of that?

A. Well that hole looked to me from the oval shape of it, as if it had a drift pin in it when it was riveted.

Q. In your opinion was that proper construction?

A. No, sir. I wouldn't pass it if I was inspecting a boat, a steel hull, or a steel boiler, such as that.

Q. All right, what else did you see? You are describing that hole, what about the other hole?

A. Well the other was, looked to me as if it had considerable heat on, and in driving the—in heating the rivet they got the plates so hot, they used such force, as to belly out both plates.

Q. What else did you see?

A. The filler inlet fitting had been brazed.

Q. While you are on that, was the outlet filler fitting brazed?

A. No, sir.

Q. At the bottom of the tank?

A. No, sir. This tank also showed leaks when we rolled it over, practically all the way along the seam,—the sides.

Q. From the water that was in it?

A. Yes, sir.

Q. Was that on one seam, or both?

A. Well when we first saw the tanks there was a seam pretty near on top of the tank; that naturally was dry. So we pushed that tank over—wait a minute, no, this is the Number Four tank; I am thinking about the one outside, that was an empty tank. I don't know about the seams on Number Four.

Q. All right; well now, are you starting to tell us about another tank, now?

A. No, sir, all this is correct on Number Four, except the leaking.

Q. You couldn't tell about the tightness of that?

A. No, sir.

Q. Now did you notice the state of the rivets on the Number Four tank?

A. Yes, sir; they were corroded, and you could get your knife blade under some of the edges of the rivet heads.

Q. Anything else?

A. Well they were not in line; that is, you could run your eye along, you could see where the rivet heads were staggered.

Q. Anything else?

A. Nothing I can think of.

Q. Did you notice the state of the inside of the tank?

A. Well I didn't go in the tank, but I could see there was considerable rust and corrosion there.

Q. Now did you examine the part of the tank that had been cut off?

A. Yes, the bulged part.

Q. What did you observe about that?

A. Well there was a bad bulge in the crown of that tank, that I could tell.

Q. Did you notice whether there was any evidence of solder on the rivets around the bottom?

A. Yes, sir, I believe there was rivets on the bottom of the tank, not at the side.

Q. Yes, but did you see solder on the rivets?

A. No, not on the rivets, no; in fact I didn't see solder on any rivets of any of the four tanks.

Q. Well now is there anything else you had in mind to tell us about Number Four tank?

A. No, sir, I think that covers Number Four.

Q. Which is the next one?

A. Then I looked at Number Two tank.

Q. What did you observe about that?

A. There were several places along the seams where you could insert the point of a knife between the two

plates; and the rivet next to the joiner piece on that side seam, the head of it was crushed into the space in the corner of the two seams. I don't know whether that makes it plain or not.

Q. Well perhaps you could tell us a little more about it, and we may get the idea.

A. May I demonstrate with this?

Mr. Botts:

A demonstration won't go into the record, Captain, and will mean nothing to the Court.

Q. What do you mean by the joiner rivet?

A. Well that is where the two side plates met. The inside plate is tapered off, supposed to go to a feather edge; and where this outside plate lapped the inside plate, that makes a little hollow there, and that rivet, right in that corner, was jammed in there pretty bad; in fact the head of it was not properly headed up.

Q. And what was the effect of that, in your opinion?

A. Well there was only half of the rivet head which was holding anything, in my opinion.

Q. What would be the effect of that with respect to the tightness of the tank?

A. Well my opinion, that is one place where you should have a perfect rivet.

Q. Well considering the conditions as you observed them, what is your opinion of the effect on the tightness of the tank?

A. Well it didn't make as strong a job as if there was a good rivet in there.

Q. Now along the side seam, you said you could put a knife in spots; what does that mean?

A. Well that meant that the outside plate, where it lapped, did not permit perfect contact with the plate under it.

Q. Now did you notice anything about the riveting on the side seam in that tank?

A. Well those rivets,—in fact in none of the tanks did the rivets line up in perfect line.

Q. All right.

A. The filler inlet was also brazed in this tank; and on this tank I observed at least three cracked rivet heads.

Q. What does that mean?

A. Well, imperfect riveting is all I can say. And then underneath these cracked heads you could slip the point of a knife in a short way.

Q. And what does that mean?

A. Well, imperfect riveting.

Mr. Botts:

Why?

Q. Why do you say that, Captain?

A. Well, it wasn't riveted right. It should have been backed out; if there was an inspector on the job he would have condemned that rivet and they would have had to ream it out and put a heavier rivet in.

Q. If the rivet had been in perfectly, how would it fit to the surface?

A. Well the whole lip of the rivet should be down contacting the plate. In other words, it should contact all around the lip of the rivet.

Q. What else did you observe about that tank?

A. There was one very bad rivet, about in the middle of the seam, that didn't contact the plate all the way around; you could get your knife blade under it pretty well. No solder on any of the rivets. This is the tank that we first rolled over, and found bubbles of water all along the seam, after rolling. Of course when that seam is on the ground you couldn't see it, but when we rolled it, it was still oozing out.

Q. Was there water in the tank?

A. Yes, sir, I should say it was a little better than half full, something like that.

Q. Did you observe one side seam on that tank, or both?

A. Just the one; one seam had been on top; we rolled that over, and that was dry when we rolled it.

Q. Was that above the surface of the water?

A. That was above. The tanks were not full.

Q. What else did you observe?

A. At that bubbling attack, was where two plates lapped; that little point where there is supposed to be a feather edge, you could put a knife blade into that little crevice a full half inch. There is a picture of it.

Q. What does this exhibit indicate?

A. This is the one I have reference to. In good boiler and tank work, that should come right out to a feather edge.

Mr. Botts:

In the record, that won't mean a thing; when you point, we can see it, but it won't mean a thing to the Judge. Remember your testimony has to be in shape so the Judge can understand what you are talking about.

A. I am perhaps not acquainted with the proper language. Here is the knife blade; I had my knife in there myself; that went in, I don't know whether it touched the rivet or not, but it would be pretty close to it.

(By Mr. Matteson):

Q. Which plate is it you say should have a feather edge?

A. This one that goes underneath.

Q. This one that goes underneath the outside plate?

A. It should be tapered right out as thin as possible. Instead of that, this inside plate has quite a thick edge.

Q. And what did that indicate to you with respect to the tightness of the tank?

A. Well it is quite apt to leak there unless it was brazed.

Q. What else did you observe with respect to that tank?

A. Well we saw the traces of where they had used soap water in testing it out, on the tank.

Q. Is that what these streaks are on the tank?

A. Yes, sir; and you can see by this photograph, that this line of rivets are not in line.

Q. The line of rivets along the side seam?

A. Yes, sir; are not in line; some are closer to the edge than others.

Q. This photograph that we are looking at now is Libelants' Exhibit 152, is it?

A. Yes, sir.

Q. Now what else did you observe with respect to this Number Two tank?

A. No solder on the seam; no solder up there; no evidence of its having been there.

Q. Captain, let's get that straight. You say there was no solder around the top seam between the crown and the sides?

A. Or the side seam.

Q. Or the side seam, on the end toward the crown?

A. No, sir.

Q. Did you notice whether there was any solder on the side seams of this tank?

A. None except for that twenty inches on the end of it.

Q. Did you examine the seam above that point, for the purpose of determining whether there were any traces of solder or not?

A. Yes, sir; I examined that very closely, and scraped it; but I couldn't see where there was any solder or residue of solder, or discoloration of solder.

Q. What else did you observe about this Number Two tank?

A. Well we found some of these rivet heads cracked. That number one, that shows there.

Q. You are referring to the rivet ends at the top, on the side seam?

A. Yes, sir; that is a cracked rivet.

Q. That shows in the picture, does it?

A. Yes, sir; these rivets along here. Here is a cracked rivet.

Q. You are referring now to the second one?

A. On the right.

Q. It is the second one on the left, isn't it?

A. No, this is your tank, standing up.

Q. Oh, I see. We will call this the bottom, where the date appears on the tank?

A. That is the bottom of the picture, but not of the tank.

Q. If you hold the picture with the bottom down, the rivet you just referred to is the second rivet to the left?

A. Yes, sir.

Q. Of the seam, is it not?

A. Yes, sir, and this second one at the top.

Q. And the second one on the side seam?

A. On the side seam. Here is another cracked rivet; the rivet is cracked, and you could get your knife blade under that plate.

Q. Now you are referring to the rivet which is the fourth to the left of the side seam, and the second one in from the margin of the picture, is that right?

A. Yes, sir.

Q. Anything else?

A. I did testify regarding those bubbles of water when we turned it over.

Q. Yes. Is this the seam in the picture, where the water appeared?

A. No, sir, that was on the top, and we rolled it so we could see the bottom seam.

Q. What else can you testify to about that tank?

A. That is all I can say about the tank; I didn't get into that tank.

Q. Had any piece been cut out of the tank, did you notice?

A. Yes, sir, there was a section cut out.

Q. Did you put your hand inside of that tank?

A. Yes, sir.

Q. What did you observe in that fashion?

A. Well there was evidence of corrosion in there, and dirt.

Q. Where was the section cut out of the tank? Was that on the other end?

A. The other end of this, the bottom.

Q. That would be the bottom of the tank?

A. Yes, sir.

Q. And what evidence of corrosion did you find in there?

A. Well it felt like hard globules of rust in there.

Q. Was that on the bottom or the side of the tank?

A. On the side and on the bottom, where I could feel.

Q. Now, did you notice the double plate on that tank?

A. I noticed the one that is in that photograph.

Q. Here is a photograph.

A. No, sir, I didn't look inside of that. I looked at the rivets; they were pretty badly corroded,—the heads.

Q. The four rivets holding the doubler plate?

A. Yes, sir. One of them was very bad,—or two.

Q. You are referring now to the rivets on the doubler plate on the Number Two tank, which appear on the left-hand side of Exhibit 153, is that right?

A. Yes.

Q. Which were the ones you said were particularly corroded?

A. This one here.

Q. The one that is marked B?

A. B, yes.

Q. The one that is marked D on the photograph?

A. Yes, sir.

Q. When you say they were badly corroded, just what do you mean?

A. Well there was no head to them, practically; it is all rusted away.

Q. Referring to the one marked D?

A. Yes, sir, and also B; in fact they were all corroded; these two were bad.

Q. A and C were not as bad?

A. No, sir. That was a different fitting.

Q. When you speak of a difference in the fitting, what is that? Just explain to us what you mean.

A. This is small, I should say a quarter inch pipe; I didn't measure it.

Q. And you are referring now to the fitting on Number Two tank; you say the opening in that fitting, in your opinion, was for approximately a quarter-inch bore pipe?

A. I think so.

Q. What is the difference between that fitting and the fitting shown in the right-hand side of the picture?

A. Well that looks like a three-quarter pipe. I didn't measure that, I don't know. A much larger pipe.

Q. If a pipe such as would fit the bore on the fixture in Number Two tank, were to be affixed to the fixture on the Number Four tank, how would that have to be done?

A. You would have to put a reducer bushing in there.

Q. Then you would have two reducers attached to the tank?

A. No, you can get a three-quarters to quarter; that is in addition to these.

Q. You have a reducer shown in the picture?

A. Yes.

Q. And if you wanted to use a pipe the same size that apparently was affixed in Number Two tank, you would have to put a second reducer?

A. Yes, sir, that is right.

Q. Can you give any reason, from your experience, why they would use two reducers in a tank, such as may have been done on Number Four?

A. I have no knowledge of why they did it, unless perhaps they couldn't get a sufficient number of standard fittings, of all one kind, to put in there.

Q. Now do the rivets on the doubler plate appear on this section of Number Four tank shown on Libelants' 153?

A. Yes, sir; you can see them here.

Q. They are marked C, D, F and G, are they not?

A. Yes, sir; they are corroded away too.

Q. Is there anything else you want to call our attention to with respect to Number Two tank?

A. Number Two; well I found a lot of rivets along the bottom of Number Two tank that was badly corroded,—rusted; very little heads remaining.

Q. Is there anything else on Number Two tank?

A. No, sir; none I can think of.

Q. Now what is the next tank that you want to tell us about?

A. Then I examined Number Three tank, that was outside in the back.

Q. What did you observe with respect to that?

A. Have you got the picture there, of that fitting?

Q. I show you Exhibit 155; is that the one you are referring to?

A. Yes, sir; let's see. I examined that for the threads, and I could find one full thread and two apparently badly worn threads. And that wouldn't be sufficient for me to even put a water—screw a water pipe in, for safety.

Q. Well, what else did you observe about that?

A. That has got one of these plates back of it. I didn't measure the distance of the rivets, but I assume they are about the same.

Q. They appeared to be about the same?

A. Yes, sir.

Mr. Underwood:

What was that which appeared to be about the same?

A. The rivets in that—rivet heads.

(By Mr. Matteson):

Q. Suppose you indicate those rivets. Is this one here?

A. Yes, sir.

Q. Let's call that C. Is this one, here?

A. Yes.

Q. Call that D.

A. I imagine that is—

Q. We will call that one E.

A. And that—

Q. Call that one F. Were you able to determine the condition of those rivets, Captain?

A. There wasn't much of the head left,—the rivet heads, I mean.

Q. Did you notice anything else in that connection?

A. No. We also rolled this tank over, the dry seam was on top, and we rolled it over so we could observe the lower seam; and that seam was leaking, about seventy-five percent of the distance; little bubbles of water coming out.

Q. And how much water was there in the tank, Captain,—about half full?

A. Just a little better than half full, I should think.

Q. The tank was lying on its side?

A. Yes, sir.

Q. Anything else about the Number Three tank?

A. This is the tank that didn't have any solder on—

Q. On what?

A. On rivets or side or top or bottom seams, that I could see.

Q. Well now—

A. I didn't look at the bottom; I wouldn't swear to the bottom. But on the side seams there was none down to the bottom.

Q. And did you examine it for the purpose of determining whether there were any traces of any solder having been there?

A. Yes, sir; I did examine it.

Q. And you found none?

A. No, sir. There was no solder on the seams either, that I could find. I made these notes while I was there; none on bottom seam or top seam on that tank.

Q. What else did you see?

A. There was several rivet heads that were bad, on this tank, up from the plate, so that you could get the point of the knife under. In other words, they were not headed up properly,—or headed down.

Q. Where were they, on which seam?

A. On the side seam.

Q. Does that show in this picture?

A. I don't know whether it does. One of them was caulked up on one edge pretty high, so you could get your knife pretty well under; we didn't take a picture of that. This tank had a brass plug in the bottom.

Q. It had a brass plug in the center of the bottom?

A. Yes, sir.

Q. What did the other tank have?

A. Let's see; iron was in one; Number Two had a brass one; I wouldn't say what Number Four had, although I examined it, I didn't mark it down there.

Q. Number One had an iron plug, and Number Two and Three had brass; is that what you say?

A. Number Two had brass, Number Three had iron—no; Number Three had brass and Number One had iron. Now I have got it right. These filler plugs, they were all brazed in with bronze or brass.

Q. Those are the two-inch holes at the top of the tanks?

A. Yes, sir.

Q. Were the openings of the bottoms of the tanks, with the outlets attached, were they brass?

A. You mean, where the feed line went out?

Q. Yes.

A. No, sir.

Q. Anything else on Number Three tank?

A. No, sir; not that I know of.

Q. All right, what is the other tank?

A. Then we went to Number One. That was leaking badly along the side seam, and from some rivets—that is after we rolled it over.

Q. And how much water was there in that?

A. I didn't measure it; there was a lot of water in it.

Q. About half full, or more or less?

A. Possibly a little more than half full.

Q. The tank was lying on its side?

A. Yes. I also made notes that there was water leaks near one of the seams on the top.

Q. Just where do you mean, there?

A. Well on the top of the crown.

Q. Where the crown—

A. At the side, on that seam, what I am referring to as the top seam.

Q. Is that in a place similar to that which is illustrated—

A. Yes, on the other side, though, from where I had the knife in.

Q. A position similar to that shown by the knife in one five two?

A. Yes, sir, that was wet; several bubbles of water.

Q. This knife as in one five two, is on tank Number Two; you are referring to Number One?

A. There was a leak on Number One.

Q. Do you remember whether there was a leak in the vicinity of the point on Number Two tank where the knife is inserted as shown on one five two?

A. As I recall it, it was on the other side of the seam.

Q. Now I think you are telling us about Number One.

A. Yes, sir, and there was evidence of leak at the plug at the bottom.

Q. In which tank?

A. In Number One; there was evidence of water leak at the plug in the bottom of Number One tank; that was an iron plug.

Q. Anything else?

A. There was some badly corroded rivet heads around the bottom edge of that tank, and several corroded ones on the sides; that is Number One tank.

Q. All right, anything else?

A. There was several rivet heads where the heads were cocked up.

Q. By that you mean, not in contact with the face of the plate at one side?

A. No, sir; that's right.

Q. Anything else?

A. No, sir; that is all I observed about those tanks.

Q. Captain, I show you this exhibit 6-A and call your attention to the riveting of that tank. Is there anything you want to call our attention to in connection with those rivets?

A. From the left, number one rivet, three rivet, and four rivet, and five rivet, they are all off center, and are staggered. Number two is the only one anywhere straight, to me.

Q. When you say, off center, or staggered, what do you mean?

A. I mean the punched hole in this tank, or in this plate, didn't line up with the punched hole in the crown. Naturally the rivet had to be—the hole had to be drifted and the rivet put in, and follow that line of the drift; in other words, it went in crooked.

Q. What in your opinion is the effect of that?

A. Well the hole, the punched holes in the two tanks didn't line up properly.

Q. What difference does that make?

A. Well then you don't get a straight driven rivet.

Q. What difference does that make?

A. It is not a good job; it is a weak job.

Q. Now is there anything else about those rivets you want to call our attention to?

A. These two are pretty bad; you can get your knife, a knife blade, I believe, down alongside of the—

Q. You are referring to Exhibit 6-A, and you are referring to the section of the outside of the tank, held so the rivets are at the bottom; is that right?

A. Yes, sir.

Q. All right.

A. You can get your knife blade right down alongside of that one.

Q. You are referring to the—

A. Number four rivet and number five rivet.

Q. Numbering from the left?

A. Yes, sir. The reason for that is because your rivets don't go through straight.

Q. Now do you observe any evidence of soldering about those rivets, Captain?

A. No, sir, I don't. Number two rivet is the only one I would pass, if I was inspecting the tank.

Q. Is there any evidence of solder on the heads of the rivets on the inside of the crown?

A. No, sir; on the edge, but not on the crown.

Q. None on the crown?

A. None on the rivets, no, sir.

Q. I show you 5-Y; is there any evidence of solder on the riveted heads of the rivets, on the outside of the tank?

A. No, that is just rust.

Q. How about on the heads of the rivets on the inside of the crown?

A. No, sir, that is rust.

Q. No solder there?

A. No, sir; none except on the edge.

Q. I show you Exhibit 5-X; is there any evidence of solder on the riveted heads of those rivets?

A. No, sir.

Q. Any on the rivet heads?

A. No, sir; except that little spot that run down from soldering the edge. The number one rivet is bad.

Q. Number one rivet—

A. From the left.

Q. From the left, when the riveted heads are held at the bottom, is that right?

A. Yes, sir; that's in crooked.

Q. I show you now 5-Z; is there any evidence of the rivets being soldered,—and rivet heads, that you are speaking of?

A. No, sir.

Q. How about the rivet heads?

A. No solder on the rivets.

Q. On either side?

A. No.

Q. How do those rivets line up?

A. One two and three are decidedly staggered; one, two and three from my left.

Q. When the rivets are held towards the bottom?

A. Yes, sir.

Q. Looking at it from the outside of the tank?

A. Yes, sir.

Q. Now I show you this Exhibit, Libelants' 154; can you tell us what that shows, or what observation is illustrated by that?

A. It shows that whoever cut out that sheet, this outside sheet—

Q. That is the sheet in the upper half of the picture?

A. Yes, sir; evidently the sheet got away from them under the shears, and he went in there—I have got the distance of it; he went in on the sheet five-thirty seconds of an inch.

Q. And what is the result of that?

A. It weakened that sheet in the way of these rivets.

Q. Did you notice whether or not there was any leakage along the seam?

A. Yes, sir; there was.

Q. Where about?

A. Right along here by the rivets, on different spots along that seam. Yes, sir, that whole seam was leaking pretty much, the whole length of it.

Q. You mean from the head of the water that a little more than half filled the tank?

A. When we rolled that over we could see little bubbles of water; not bubbles, but—

Q. Globules?

A. Globules of water was all along in there. I want to point out to you, I just want to use this for a ruler; if you put that straight edge on the bottom of that rivet head and the bottom of this one, you will see what an uneven job they did of riveting.

Q. If you put a straight edge along the line of rivets on the side of Number Two tank as shown in Libelants' 154, you are calling attention to the fact that the rivets are out of line?

A. Yes, sir; decidedly out of line. This is too high, that is too high, that one is too high; so is that one.

Q. Now, Captain, taking into account what you have now seen of these tanks, in your opinion were they proper

tanks for the containing of gasoline on a vessel such as the Seminole?

A. I think I testified to that question before; that in my opinion, those tanks were the type of single riveted galvanized tanks used for storage of water.

Q. In your opinion would they be adequate for the storage of gasoline?

A. No, sir, I wouldn't pass them for gasoline; not riveted galvanized tanks of that size.

Q. When you say that, are you taking into account these conditions that you have observed?

A. Yes, sir; but had I never seen this condition, I wouldn't care to have passed those tanks for gasoline.

Q. After seeing the way the tanks were actually constructed, what is your view on that?

A. I am positive I wouldn't have them. There is no way to examine the inside of those tanks, or the outside. A tank of that construction, where that feather edge—may I ask what is the proper name of that? Well, the inside plate was supposed to be feather edged for the riveting. That's one bad hazard, unless that is put in properly.

Q. You are referring now to the places similar to the place where the knife is shown in the picture?

A. Yes, sir. I am not a boilermaker, so I don't know the terms to use.

Q. Captain, did you see any evidence that the condition of those tanks had been materially affected by the fire?

A. No, sir; I can't.

Mr. Matteson:

That is all.

Cross Examination.

By Mr. Botts:

Q. Mr. Patton, referring to the Number Two tank, and the opening in which the plug shown in Exhibit 153 appears:

A. Yes, sir.

Q. Did you observe the thickness of the doubler plate in that hole?

A. No, sir, I didn't measure it.

Q. Well did you observe it, to see whether it was as thick or thicker than the metal of the tank?

A. I believe it is considerably thicker than that.

Q. Irrespective of its actual thickness, it was thicker than the—

A. Than the shell of the tank; I am pretty sure of that.

Q. Now in the Number Four tank, in which you were able, because that end was shut off, to examine the doubler plate on the inside of that tank, weren't you?

A. Yes, sir, we could see it.

Q. Was that doubler plate thicker or thinner than the walls of the tank?

A. That was thicker, I believe. I think, all that I could feel or see were thicker, to the best of my knowledge.

Q. At least on those two tanks, the doubler plate was thicker than the walls of the tank?

A. Yes, sir, and I felt in on one of those holes with my hand, and I didn't in the others.

Mr. Botts:

Have those rivets been marked in evidence, yet?

Mr. Underwood:

No.

Mr. Botts:

Well, Mr. Pilkington is an innocent sort of a party in this thing—

Mr. Underwood:
We dispute that.

Mr. Botts:

I believe it is conceded that those rivets which you have produced, are the rivets that came out of the two holes in the Number Four tank; is that right?

Mr. Underwood:
Not conceded, but asserted.

Mr. Botts:

I would like to have those marked in evidence now as Pilkington's Exhibit, under that statement, just to get them in as somebody's exhibit; so you may give those rivets Pilkington's next number.

(The said two rivets and burrs were admitted in evidence and filed as Pilkingtons' Exhibit 17.)

(By Mr. Botts):

Q. Could you observe whether or not the rivets on the doubler plate on Number Four and Number Two tanks, whether they were apparently the same size as the rivets in the seams of the tank?

A. As far as I know, they are.

Q. I will ask you if in your judgment rivets the size of the rivets which are in evidence as Pilkington's Exhibit 17, would, in your judgment, be strong enough to create a liquid tight joint for water or gasoline, where the space between the rivets was two and seven-eighths inches?

A. No, sir, not that far apart.

Q. Now I call your attention to the position of the riveted heads along the side seam of tank Number Two, as shown in Libelants' Exhibit 154, with respect to their relative position as to being in line horizontally, and their relative position with respect to each other; and I will ask

you if you observed whether or not that seam of rivets is in line?

A. No, sir; I testified to that.

Q. I will ask you whether or not the rivets seem, as indicated by the heads, the rivet heads, are equally spaced relative to each other, or whether some are closer and others farther apart?

A. They appear to differ in the space from rivet to rivet. That would be hard to prove, because the rivet heads are squashed down further on some than on others. I wouldn't care to answer that. See, for instance, some of these rivet heads are squashed over on one side.

Q. Now referring to Exhibit 154 and 155, I will ask you whether or not you—

A. This is 153.

Q. Make that, 153 and 155, please, Mr. Bryant. I will ask you whether or not the plug from Number Two tank as shown in Exhibit 153,—whether or not you applied or attempted to insert that plug in the hole in Number Three tank as shown on Exhibit 155?

A. No, sir; I didn't attempt to do it.

Q. Did you see it done?

A. I can't say that I did. I know I screwed one plug in, I think it was on Number—it was a fitting that had been chewed up so bad; I know I tried that.

Q. But you didn't try to see whether that same fitting would fit the other tank?

A. No, sir.

Mr. Botts:

All right. I think that is all.

By Mr. Underwood:

Q. Captain Patton, you referred to an indentation in Number Four tank an eight of an inch long, and an eighth of an inch deep; did you put some sort of an instrument in there?

A. My pocket knife.

Q. Is it your testimony that that is a hole through the side plating of the tank?

A. I didn't testify to that, no.

Q. I am asking you, is that your testimony?

A. No.

Q. The hole does not go through, does it?

A. No, sir.

Q. Now you said that these side seams and bottom seams of rivets were not in line; does that necessarily mean that these tanks leaked?

A. No, sir; not necessarily. It shows poor construction.

Q. And you said that the rivets were not equally spaced; does that necessarily mean that those tanks leaked?

A. No, sir. It means poor construction. I didn't measure off the punch holes equal spaced.

Q. According to my notes, Captain, you said that there was no solder around the bottom seam on one of these tanks; is that correct?

A. There is one didn't have any.

Q. According to my notes, that was Number Three tank. Will you look at your notes and see whether that is what you noted today?

A. That is right, no solder on bottom seams or on side seams.

Q. By the bottom seam you mean the little rectangular space?

A. Yes, sir.

Q. Between the bottom edge of the side plating?

A. Yes, sir.

Q. And the bottom edge of the vertical-crown?

A. Right.

Q. I show you Exhibit 6-A and ask you to examine the bottom seam. Do you see any solder there?

A. Some little, yes.

Q. Take your knife.

A. I can see some traces there. I didn't notice any on the rest of the tank that I examined.

Q. Isn't it a fact, Captain, that there is considerable solder in that bottom seam?

A. No, I wouldn't say so.

Q. You just picked a piece of it out.

A. That is loose.

Q. It came out of the bottom seam, didn't it?

A. Yes.

Q. Do you notice where your fingernail has been down there just then, do you notice how bright that is in the crack? Isn't that solder?

A. I wouldn't swear it was.

Q. You did say a few moments ago that you didn't see any, didn't you?

A. Yes, and I am not positive it was not on that twenty inches on the other side.

Q. I am talking about the bottom seam now, Captain. Isn't that solder you are digging up right now?

A. Yes, sir.

Q. There is then, solder on the bottom seam, isn't there?

A. There is on this piece.

Q. You were mistaken about that, were you?

A. Yes, yes; I believe I was.

Q. Did you confer with Mr. Matteson this evening before you testified?

A. No, sir.

Q. Or, this afternoon?

A. No, sir; I have not been coached in this matter.

Q. You didn't confer with him at all before testifying on this point today?

A. Not on this stuff, no.

Q. Not at all?

A. No, sir.

Mr. Matteson:

Eminently correct.

(By Mr. Underwood):

Q. Did you confer with anybody before testifying to-day on this subject?

A. At the tanks, I pointed out things to Mr. Matteson; he called to my attention, things; that was the conversation; we did not compare notes at any time.

Q. Do you remember when you testified last March?

A. On what?

Q. Do you remember that you did testify last March?

A. Oh, yes, sir; I did.

Q. Did you confer with anybody before you testified that time?

A. Not to any great extent. No one told me the answers.

Q. Captain, I don't want you to get the impression that I am suggesting there is anything wrong in your conferring; I am just trying to ascertain what the fact is.

A. No, we did very little talk, that Mr. Matteson and I went over on this subject, whatever.

Q. Before you testified in March, didn't you tell Mr. Matteson what your observations were?

A. Yes I told him my observations, but he didn't tell me.

Q. Now, Captain, let me say again, I will ask you to assume that there is nothing wrong in your conferring?

A. There wouldn't be, with me.

Q. I don't want you to think that I am making any such implication; I am just trying to find out what the fact is. Is it a fact that before you testified last March, you told Mr. Matteson your observations—

A. I told him everything I knew about this case; yes, sir.

Q. And you had been aboard the Seminole?

A. Oh, yes.

Q. Many times?

A. Well when she was up at Lauderdale I was aboard her quite a number of times, and perhaps three times at others.

Q. And you have made observations for the purpose of this case, had you not?

A. Yes, sir.

Q. You testified last March, did you not, that you observed that the rivets on the tanks were not welded; isn't that the fact?

A. Yes; I testify now they were not welded.

Q. And did you also testify last March that you observed that the seams were not caulked?

A. I may have. I would still stick to that.

Q. You didn't testify anything last March about seeing this aperture, or this space between the upper crown of the tank, and the side plates of the tank, did you?

A. Just what is that space?

Q. Between the upper crown, or the top piece of the tank, and the side plating,—did you?

A. I don't recall that I did.

Q. They were exposed to view from the beginning, after the fire, were they?

A. I walked all over the tanks, several times.

Q. They were exposed to view from the beginning, right after the fire, weren't they?

A. That is quite right.

Q. You didn't testify last March about seeing any rivet heads corroded, did you?

A. I don't know that I was asked.

Q. You didn't testify anything about it did you?

A. I can't recall; if you read the records, I will substantiate anything that is in the record.

Q. You didn't testify about any rusted rivet heads or cracked rivet heads, last March, did you?

A. Not that I recall. If I was asked, I answered.

Q. You don't want us to understand, Captain, do you, that the spacing of the rivets in the doubler plates in these tanks, would necessarily involve a leak, do you?

A. Yes, sir; I do; I don't think they were close enough. If, instead of four, they put eight in there, it would be a much safer job.

Q. You think then that if these tanks were constructed as you say, with only four rivets in these doubler plates around the outlet hole, they would necessarily leak; is that right?

A. It is quite possible they would leak.

Q. That isn't my question. Is it your testimony that they would necessarily leak?

A. I didn't say that.

Q. I am asking you, Captain, is that what you say, or is it not what you say?

A. They might never leak with those four rivets in, and then again they might. But I contend,—I still contend there should be more rivets in there for that space.

Q. Captain, I appreciate your contention; all I am trying to find out at the moment is whether or not you say that because of that construction, those doubler plates necessarily leaked?

A. I never said that.

Q. You don't say that?

A. No, sir.

Q. Is it your testimony, Captain, that you see no effect of fire on those tanks?

A. No, I don't see any material effect, no.

Q. What do you mean by material effects?

A. Well, the galvanizing would be discolored from being in the fire; but you can still take that side of that galvanized plate and polish that up.

Q. Which plate do you refer to?

A. That one is pretty well gone. This one might polish up a little bit.

Q. Indicating Exhibit 5-V.

A. I won't say yes or no until I get a chance at this. There is some galvanizing left there.

Mr. Underwood:

Let the record show that the witness takes his knife and scrapes a place a quarter of an inch wide and three inches long, approximately, on the outer surface of Exhibit 5-V.

A. I can't say that those tanks are materially changed from before the fire.

Q. The galvanizing material is zinc, isn't it?

A. Yes, sir.

Q. Do you know what the melting point of zinc is?

A. Give me the book.

Q. No, I am just asking you.

A. No, I refer to the book.

Q. What is that you see, on that plate you just scraped off? What is that grayish material you see under there where you scraped?

A. I think that is the galvanizing.

Q. And looking at the concave side of Exhibit 5-W, do you see four scraped places on that?

A. Yes, sir.

Q. What is that greyish stuff you see?

A. There is traces of galvanizing; it is pretty thin though.

Q. It isn't all gone is it?

A. Well ninety-eight percent.

Q. You mean ninety-eight percent of the galvanizing is gone?

A. Yes, you can just see,—get the light on there now, you can just see what is left of the galvanizing.

Q. What is the grey stuff you see?

A. I am not a chemist; I can't tell you.

Q. Can you recognize that for galvanizing or for steel?

A. I can the shiny part. Steel would be shiny if you got into it and scraped it. You will have to ask a chemist what that grey stuff is. I don't know; I am a sailor.

Q. You don't know whether that is galvanizing or steel, on Exhibit 5-W?

A. Yes I do; zinc is shiny; if there is any particle of zinc adheres to steel, you scrape it, it will still be shiny.

Q. Then all the shiny stuff you see there is zinc?

A. No; where the light hits it and it shines like silver, I say that is zinc.

Q. Now is it your testimony that because there was no solder on the rivet heads, these tanks would necessarily leak?

A. No I didn't testify to that.

Q. Well is that your testimony?

A. No. But you have got a peculiar way of putting a question up to a man, to lead him to think that he had testified.

Q. Do your questions embarrass you, Captain?

A. No, not at all.

Q. Your conscience or your recollection?

A. I have got a clear conscience.

Q. Now is it your testimony that these tanks would necessarily leak because of what I just suggested?

A. No. I am surprised, though, that this type of riveting does not leak.

Q. By the way Captain, when you spoke of cracked rivets that you have observed on these tanks within the last thirty hours, I take it you refer to cracks around the head of the rivets; is that right?

A. The edge, the lip of the rivet in there.

Q. You don't refer to cracks in the shank?

A. No, of course we can't tell what shape the shank of a rivet is in, after it is driven in crooked, but this edge is where the cracks develop or start.

Q. You refer to the outer edge of the head?

A. The edge of the mushroom.

Q. Well, Captain, is it your testimony that these tanks necessarily leaked at or prior to the time of the fire?

A. That they necessarily—

Mr. Botts:

I am going to object to that form of question, for this reason; the question is confusing in that it does not specify, when it states, "Is it your testimony", that the question refers to the testimony previously given, or whether or not it is intending to interrogate the witness as to his

present opinion. I think the question is unfair in that respect.

Mr. Underwood:

Well rather than argue the point, I would be glad to accept Mr. Botts' suggestion.

Q. Captain, is it your testimony right now, at this minute, that these tanks necessarily leaked at or prior to the time of the fire?

A. I never testified to that effect; but something did leak.

Q. Is it your testimony that the tanks necessarily leaked at or prior to the time of the fire?

A. No, sir; I never testified to that.

Q. Do you now testify to that?

A. I don't know whether they did or not.

Mr. Underwood:

That is all.

By Mr. Botts:

Q. With reference to these rivets, do you think that a riveted tank, with metal of the thickness indicated by the pieces of the various tanks filed in evidence, where the riveting consisted of a single row of rivets, that if those rivets were spaced two and seven-eighths inches apart, it would make a proper and tight tank?

A. You have reference to the tanks now?

Mr. Botts:

Read the question.

(The question was read by the reporter.)

A. No, sir; it would not. I think it would be impossible to make a tank tight with that spacing, unless welded afterwards.

Mr. Botts:

That is all.

Re-Direct Examination.

By Mr. Matteson:

Q. Is it your testimony, Captain,—what is your testimony as to whether the tanks leaked at this time or not, today?

A. Today? I should say they did leak.

Mr. Matteson:

That is all.

A. Especially with water. If you put gasoline in there in that tank today, it would run out.

Re-Cross Examination.

By Mr. Underwood:

Q. Captain, I have one more question which I have to ask. Is it your testimony, this minute, right now, that these tanks necessarily leaked at or prior to the time of the fire?

A. That they did leak at—

Q. Yes.

A. It is quite possible they did leak.

Q. Do you say that they did?

A. No, but I say it is quite possible. Something leaked in that bilge. I was up there that night.

Q. Well now, Captain, we will assume that there was a fire and an explosion on the Seminole. You don't know where the material that burned and exploded, in the first instance, came from, do you?

A. I was not there at the start of the fire.

Q. Assuming that there was a fire and explosion on the Seminole, is it your testimony that these tanks—gasoline tanks, necessarily, leaked at or prior to that time?

A. I can't say.

Mr. Underwood:
That is all.

(Witness excused.)

Mr. Matteson:

Mr. Underwood asked me if we had heard from Mr. Lawton, in response to Mr. Underwood's request that he communicate with his Head Office in Atlanta,—the request for any additional papers that they might have relating to the inquiry made. I have reported to Mr. Underwood that Mr. Lawton has reported to us that he communicated with the Atlanta office, and is advised by them that they have no papers whatever relating to the matter. I understand that that is satisfactory, and it is admitted that Mr. Lawton would testify to that?

Mr. Underwood:
Quite right.

4424 / Thereupon GEORGE W. GIBBS was recalled as a witness on behalf of Respondents and further testified as follows:

Direct Examination.

By Mr. Underwood:

Q. Mr. Gibbs, since you last testified, have you examined the interior and exterior seams of Number Four tank?

A. Yes, sir.

Q. And the exterior seams of the other three?

A. Yes, sir.

Q. What did you observe with reference to indication of caulking on those seams? I am excepting of course the bottom seam on each tank.

A. I observed in Number Four that the crown was caulked on the inside, and that the seams were caulked on the inside as well as on the outside.

Q. Vertical seams?

A. Yes, sir.

Q. And how about the top crown seams on the other three tanks?

A. The top crown seams, they may have been caulked; there would be no way to tell, because you couldn't get in there unless you had cut a section out.

Q. You couldn't see that?

A. I could see, but not to the point where you could tell.

Q. What did you see that indicated to you that Number Four tank was caulked inside?

A. I saw a small ridge that would indicate that the caulking iron had been driven up against the edge.

Q. Are you familiar with the appearance of a caulked seam?

A. Yes, sir.

Q. Tell me again now whether or not those interior seams in Number Four tank indicated to you that they had been caulked?

A. They did.

Q. Did you examine the outside seams of the other four tanks, and the top circumferential seams for evidence of solder?

A. I did.

Q. What did you find?

A. Found evidences of solder, marked in the lower seams of the tank; the upper seams, evidences that solder had been there, but the appearance of great heat.

Q. What evidences of solder did you find above the approximate level of the twenty inches above the bottom?

A. I found a discoloration of the galvanized portion of the tank, which checked exactly with the test piece that I made, which was soldered; a galvanized strip was sold-

ered and burned, and I found a lump of solder on the top of the soldered portion of this vertical seam.

Q And approximately how many different lumps of solder did you observe about this twenty inch level, on the vertical seams, and in the circumferential seams? Did you make any count of those?

A. You mean, some globules of solder?

Q. Yes.

No, I found traces throughout the job.

(A preceding answer by the witness, was read by the reporter: "I observed in Number Four that the crown was caulked on the inside, and that the seams were caulked on the inside as well as on the outside.")

Q. Did you mean by that, Mr. Gibbs, that the outside seam of Number Four tank, the outside vertical seam, showed signs of caulking?

A. Yes, sir.

Q. And the circumferential seam at the top?

A. Yes—well, on the inside, and on the top, I could not see, I don't believe there was space for caulking.

Q. Which place,—which top seam could you not see,—the inside or the outside?

A. From the outside of the tank I could not see down into the crevice well enough to recognize the track of a caulking iron.

Q. Could you on the inside?

A. Yes, sir.

Q. Did you have a light?

A. I had plenty of light.

Q. Now were you present on Saturday last when some air was put on the tanks?

A. Yes, sir.

Q. Was any air put on Number Four tank?

A. Positively not. The test was run under my personal direction, on instructions by you. You and I arrived, and Mr. Munroe, at the same time; and one tank, Number Four tank had arrived and was filled with water, and they awaited our instructions as to what to do. We told them to proceed to cut up the one with the water, which they had prepared.

Q. That is Number Four?

A. Number Four; and when the next tank arrived, after a considerable time, we decided on the test that would be made.

Q. Well now you were present at these tests?

A. Yes.

Q. Did you observe any leaks whatever around the bottom seams of any of those tanks?

A. Absolutely not.

Q. Did you observe any leaks whatever around the vertical seams up to the point where the solder stopped?

A. Absolutely not.

Q. Did you observe any leaks around the filler outlets, — I should say, the feed line outlets on Numbers One Two and Three tanks?

A. Absolutely not.

Q. How about the bottom plug?

A. Absolutely not; no.

Q. From your examination of those tanks can you tell us whether or not the galvanizing is intact or destroyed, or in what condition did you find it?

A. In all the tanks?

Q. Yes.

A. Well the galvanizing on all of the tanks shows that it has been exposed to forces that it was put there to resist, and that it has suffered by exposure to tremendous heat, and in many cases it has completely melted off. All the tanks are filled with—when I say filled, I mean that wherever there is any residue, that I was able to find, there are bits of molten zinc. The galvanizing

on some places is crazed; that is, it has trenches; it is called—the back of an alligator; this is called alligatoring, in some shops.

Q. Is that a word that has a meaning—

A. It has to do with a smooth mass that cracks up under the influence of sudden cold.

Q. What in your opinion caused the present condition of this galvanizing, or was it one or more things?

A. I think it was two things; intense heat, and water.

Q. Did you find some evidence of—any evidence of galvanizing on Exhibit 5-W?

A. Oh, yes, sir; it is, unquestionably.

Q. In your opinion has there been any substantial reduction in the thickness of that plate due to rust and corrosion?

A. From the outside of that plate, there has been some slight reduction; on the inside nothing but—no reduction in the steel; there has been some reduction in the galvanizing.

Q. Mr. Gibbs, in your experience in tank work of this sort are the rivets ever driven cold?

A. We never drive rivets cold except in tiny pans, and very small work, where there is no great strain, or where the heat is a bad thing.

Q. You have heard the suggestion that some of these rivet holes in one plate didn't fair with the rivet holes in the other. Assuming that the rivets were driven hot; in your opinion would that make an adequate gasoline tight joint?

A. Oh yes, there is no question about making a gas tight joint.

Q. Why do you say that?

A. Because the rivet driven hot, is in a molten condition, it is ready to become a forging. It is considerably longer than the hole that it is to fill; and when that is put in this hole, as a practical proposition, you drive the soft mass into the hole, whether it is irregular or otherwise.

Q. Some reference has been made here today about conditions of the two heads of various rivets on these pieces of metal. Look for example at exhibit 5-Y: In your opinion can the present condition of those rivet heads, both heads, have been caused by the heat of a fire, or the lapse of time and their exposure to the elements for four years since the fire?

A. Oh most certainly. They are in excellent alignment, this particular sample that you give me, and there is nothing that any man could tell by looking at those rivets that wouldn't indicate that they were absolutely straight holes; with this sample. This edge of the rivets, or the side of the rivets; would indicate that the corrosion has set in here, and possibly a quarter of the top of the metal, as the result of intense heat that they were probably exposed to.

Q. You have indicated the outside, the rivets on the outside of the vertical side plate of Exhibit 5-Y?

A. Yes.

Q. Now Mr. Gibbs, from your experience will you tell us whether or not those rivets are properly in line, as work of that character goes?

A. That particular sample, they are quite well in line.

Q. Look at the other three, please, the other three segments from the bottoms of the tanks.

A. They are pretty well in line here.

Mr. Matteson:

That is referring to 5-X?

A. The alignment is not so good on section two.

Mr. Botts:

That is 5-Z.

A. It is about the same in 6-A as it is in the other one that I just read.

Mr. Underwood:

5-Z.

A. Yes.

Q. Now Mr. Gibbs, in your opinion, is exposure to fire a competent producing cause of cracking of the rivet heads?

A. Oh yes.

Q. And is exposure to fire a competent producing cause of expanded seams in tanks of this sort? Can fire do that?

A. Fire can warp tanks, or metal shapes, completely out of shape; which it has done in the case of this particular tank, where the knife was stuck.

Q. You refer to Number Two tank?

A. Yes, sir; if you will recall, while I was witnessing this examination, had laid a straight edge on the tank itself, and this not only was ~~dished~~ in as though a belt had been drawn around the tank; but it caused the outer edge of the top of the plates to bulge out like an hourglass.

Q. Now Mr. Gibbs, will you examine again the exposed edges of the plate in evidence, or segment, from the bottoms of the tanks, and tell us whether or not in your opinion they indicate the existence of a gasoline tight seam?

A. Every one of them is as perfect a demonstration as I can conceive of, of an absolutely gas tight seam, under pressures many many times greater than any pressure that these tanks could ever have been exposed to. I can look down the edge of the outer plate on any of them, and that enters the point of contact, tangent with the curve; there being no razor edge or projection to the plate, where I look. That proves to me that an extension of this line, coming tangent to the head of the tank, would give me a true picture of the joint in the tank, showing that the head and sides of the tank are pressed together, perhaps at this time, with tremendous pressure, but certainly enough to resist any leak under perhaps one hundred or

maybe two hundred pounds pressure, as far as that is concerned. And that goes for the whole four,—for each of the four.

Q. Now Mr. Gibbs, you did observe some leaks on Saturday afternoon, in the side seams of these tanks above the point where the solder was?

A. I did, and I was not the least bit surprised.

Q. My next question is, in your opinion, is the existence of those leaks any criterion by which fairly to judge the tightness of the tanks four years ago before they passed through a fire?

A. Why most certainly not. I think it would be a miracle if the tank would go through what they had gone through. The tank had been robbed of its principal element of tightness, by fire. I would think it would be quite wonderful if they would not leak.

Q. Now from your general observation of these tanks Saturday afternoon and Monday evening with the Court, and this morning, will you tell us whether or not in your opinion they were adequate and proper tanks for gasoline in such a vessel as the Seminole?

A. Well my opinion expressed when I first testified, regarding these tanks, has been confirmed by my observations of the tanks recently. I stated that the tanks were good for many, many times the pressure for which they were intended. I also stated that the one point described, by other witnesses as a danger point, a point subject to terrific corrosion, a corrosion which would destroy the rivets and render the tanks quite leaky, they stated that those points would be found in terrific condition, due to certain reasons. My examination of the tanks would indicate that perhaps the most protected point in the thing was the point they described as the weak point of the tank.

Q. Do you refer to the V in the bottom?

A. Refer to the so-called wedge shaped section of the tank, which would grab the salts and the acids and the other things that would tend to get down and eat the rivets

off. I looked for this point that I had claimed would be covered with water which would be almost distilled. I found bits of zinc down in there; I found a condition as near perfect as it could be, regardless of the fact that the tanks had been exposed to the very briny waters of this section of the country, as well as the tremendous heat that they must have suffered during the fire. The last three or four years they have not had the benefit of the galvanizing that they normally would have in use; neither have they had the benefit of protection from wind and water, that those tanks have suffered, with the tide rising and falling each day into them. In spite of that fact, in many places the tanks show what would almost be mill-scale. There is no formation of anything; the tank looks almost like the day it left the racks of the mill supply house. 5-X is a very excellent example; the zinc can be found,—traces of it, and where this acetylene cutting torch has burned that away, you have practically the original line as it went into the galvanizing, with no loss whatever of the plate. I did not know exactly how the tanks were built until we got them apart. As an examination of 5-X, which is identical in all the tanks, it can be found that the heads go almost straight to the walls of the tanks.

Q. You mean, the bottoms,—the bottom crown?

A. The bottom crown,—that it goes almost in a straight curve, or uniform curve, to the shell of the tank, from there, with a long lip, they go to the area where the rivet holes are punched. There is a great distance from the rivet holes to the point where the crown leaves the shell plate.

Q. In your opinion, is the lap of sufficient length?

A. It is of quite sufficient length. In my opinion, if every other rivet fell out, those tanks would still be tight enough to hold many times the pressure that they are called upon to hold.

Q. When you say that, you mean pressure such as these tanks might be subjected to, filled with gasoline?

A. That is right; and I also mean to say that there is a great surplus of fastenings, ~~of rivets fastenings~~, between the heads and the sides of the plates. The tanks, gasoline tanks of course are very much heavier, than the normal tank used in the average boat.

Mr. Underwood:

That is all.

Cross Examination.

By Mr. Matteson:

Q. Is the steel in these samples that you have from the tanks, a good quality of steel?

A. I would say that from what they have had to take, that it would be a good quality of steel. I have put them through no physical test, it is just a guess; but the state of preservation would indicate to me that it was a very good quality of steel.

Q. What grade of steel is that?

A. I would call that,—no way for me to say, except by analyzing it or putting it to various tests. But I would think it was mild steel.

Q. What is mild steel used for?

A. Building tanks.

Q. Anything else?

A. Oh yes, we use it for nearly everything.

Q. Use it for boilers?

A. No—with some boilers; but boilers, it depends entirely upon what the use of the boiler is. We have a tested steel, it has to have inspectors or Government test, as a rule.

Q. You have to have a Government test for a boiler?

A. For whatever the purpose is. We even use it for a lot of ships we build.

Q. In other words I take it that tanks constructed as these, would be adequate for boilers of some sort?

A. I don't know what this steel is; and there is no connection whatever between the building of this tank to hold a cold fluid, and building of a boiler to hold a high pressure and heat,—various degrees of expansion. There is no similarity, except they are both riveted, and certain laws,—expansion of joints and so forth, contained in both types of construction.

Q. Well without referring to specifications that you might have to meet, as a practical matter, are the tanks constructed of steel like this, and riveted like this, suitable for some types of steam boilers?

A. Not necessarily. I would have to find out the specifications of the boiler; and from the mill, I would get the sheet showing the characteristics of the steel,—its properties.

Q. You were suggesting at one stage in your testimony that these tanks might be used for a purpose much more strenuous than the confining of gasoline. Would you consider the use as some type of a boiler, perhaps a low pressure boiler, would be one of those uses?

A. No, sir.

Q. Why not?

A. For the reason that a low pressure boiler is subject to many things. It is subject to heat, expansion, all kinds of strains; the strains of heat, and also the water—continuous changing of water; boiler scale; terrific corrosion; various kinds of strains,—but particularly to tremendous tensile stresses, that—

Q. Why wouldn't steel like this be suitable for use in a low pressure boiler, if that boiler were otherwise designed properly?

A. As far as I know, that might be the finest boiler steel in the world; I don't know what this is. But a steel that had a tensile strength,—that was uniform in strength, in its texture.

Q. Have you any doubt that that steel would answer that description?

A. None whatever.

Q. Then, Mr. Gibbs, do I understand you to say that nevertheless this steel has been subject to distortion as the result of application of fire, in this fire?

A. Oh yes.

Q. Will you point out to me some evidence of that?

A. Well I would have to take you out, I think, to the tanks, to show you where the distortion is.

Q. You can't show us the distortion on any of these samples?

A. Well I don't know that it would show up here. But it is quite possible that the bulge there might have been due to heat.

Q. You are speaking about the plate, not the rivets, are you not?

A. Well I mean, if you will take a straight edge—

Mr. Underwood:

The plate from Number Three tank.

A. That apparently rolled. The tops of the tanks—

Mr. Underwood:

Indicating an apparent concavity in the side plating of the exhibit 6-A.

A. If you will see this one, that does not show it at all.

Mr. Underwood:

Indicating Exhibit 5-X as not showing it at all.

Q. Now of course a distortion such as you indicate there could have been caused in manufacture, could it not?

A. Not likely. It would be a most expensive thing to run that in a machine just to make it crooked.

Q. Now do you say that this distortion in the bottom, just above the line of rivets, on Exhibit 6-A, was due to heat?

A. Might have been.

Q. Well I mean, is that your suggestion?

A. It is my suggestion. Of course it is possible—

Q. How hot would the plate have to be heated before it would distort in that fashion?

A. Well what would actually happen there, it could be the whole thing could be heated, and a jet of water could be thrown right across there, and could immediately contract, and with this one perhaps the other part hot; I don't say that that was done right in here; but what throws things all out of shape and warps them, is the ununiform application of heat.

Q. Yes, but now in order to accomplish that, in a plate like that, the plate would have to be heated somewhere between cherry red and white hot, would it not?

A. There is no question but what those tanks were heated cherry red, maybe white hot. However you wouldn't have to heat them in order to distort them, much more than a very dull red.

Q. Now you say that in your opinion all of these sections were heated between cherry red and white hot?

A. No. In my opinion, I don't think that but one of those sections was heated very hot. I can't tell that; I don't know just what the conditions of the fire were. But it is my opinion that at least three of these tanks were fairly cold.

Q. Well now referring to this one that you suggest was heated, as I understand it:

A. No I didn't suggest that, I said that that might have been some heat distortion.

Q. Well what I am getting at is this; you can't distort cold steel very readily, like that, can you?

A. It would take something to distort it.

Q. Well your suggestion is that this curvature in the Exhibit 6-A was produced as the result of its being heated to—

A. Not necessarily; I didn't mean to do that. I meant to show you what distortion by heat would be. That exists in a marked degree in the upper portions of the tank; it could have been the cause of this. I don't say that heat did distort that; it could have done it.

Q. Just let's talk about that hypothesis. If it could have been, it would have been necessary first to have been heated red hot, would it not?

A. If that was the cause of that thing going out of shape there?

Q. Yes.

A. It would have been necessary for some material heat, yes.

Q. It would have been necessary—you can't bend steel of this thickness, readily without its being heated at least red hot, can you?

A. Oh you can bend steel cold. That would be a very difficult section to bend, to the curvature.

Q. It would be very difficult to bend it cold?

A. That is right.

Q. So we assume that it was bent in the fire—

A. I am not assuming that that was bent in the fire.

Q. I am.

A. Oh, I see.

Q. I am assuming for the minute that it was bent in the fire, and the point that I make is that if it was bent in the fire, it would have been heated red hot, or so?

A. I think it would have been pretty warm.

Q. Well it would have been—you would have had to get it red hot to produce that curvature through heat, wouldn't you?

A. It would have to be pretty hot to have stayed there, —to have remained.

Q. Which tank did this tank come from? (Referring to Exhibit 6-A.)

Mr. Underwood:
Number Three.

Q. If the bottom section of that tank was heated red hot, you couldn't imagine solder staying on it, could you?

A. No, if that was heated red hot.

Q. Now Mr. Gibbs, you examined these tanks up on the Seminole did you not, at Nuta's yard, before they were removed to DesRocher's?

A. In a way. I looked at the tops of them, that is about all I could see. I think I saw through the hole.

Q. Did you see any evidences of heat distortion, up there?

A. I didn't—yes, they looked to me like the tanks had been pretty badly burned.

Q. Well did you at that time have any opinion as to whether they had been distorted by the fire or damaged by the fire?

A. I had a very marked opinion, very decided opinion, that they had been damaged by the fire.

Q. And you examined the Number Four tank up there did you not?

A. Oh yes; that was the one they tested?

Q. The Number Four tank was the one that was lying on deck. You don't know anything about any test?

A. There was one tank taken out of the—there were four tanks in the boat, one tank was removed from the boat. I examined all of them.

Q. Did you examine all of them up at Nuta's?

A. Yes, just looked at them.

Q. And up there; did you see any evidences of distortion by heat?

A. I didn't look for it. I only looked for the—I only saw that they were very badly burned, from the condition of the outside.

Q. Well having regard for the construction of the tanks, and the fact that they had been through a hot fire, at that

time did you have an opinion that they had probably been damaged by the heat?

A. Oh yes. I have seen a great many burned tanks.

Q. Well now, if the bottom section of these tanks had been greatly heated, placed as they were in the Seminole, where would that heat have come from?

A. I don't know.

Q. It would necessarily have come from underneath them, would it not?

A. If the bottom were heated; there was evidently heat around the bottom of that tank.

Q. You noticed the condition of the wooden stringers on which the tanks rested up there, did you not?

A. Yes; you mean the stanchions, the vertical pieces?

Q. No, I mean the horizontal pieces that were in the trays.

A. That is the one that I saw.

Q. And that I think you testified was not even charred?

A. Yes; showed no signs of heat.

Q. Whose suggestion was it that these tanks be brought down to Warriner's for the work that was done down there?

A. I don't know.

Q. Did you have anything to do with that?

A. Nothing at all.

Q. If these tanks showed evidence of fire damage; likely to have affected their integrity, while they were up at Nuta's, can you suggest the reason why they should be brought to DesRocher's or to Warriner's and placed under an air test?

A. I am employed as an expert witness in this case; the reasons for the method of conducting the case, I have no interest.

Q. Possibly you could suggest a reason.

A. A reason for what?

Q. For making an air test under these conditions.

A. Well I suggested the air test instead of a water test.

Q. When did you suggest that?

A. When they started to test them.

Q. Do you mean to tell me, Mr. Gibbs, that as close as you have been on this case, you have never been consulted about the advisability of moving these tanks down to Warriner's and placing them under test?

A. Absolutely; on the contrary, I had all kinds of suggestions that I am ashamed of, and was told to do my work and the lawyers would do theirs. I have been very reluctant to make any suggestions to them at all, except in connection with the—

Q. When did you first know that a test was contemplated?

A. A very few minutes before I was asked to go to Warriner's,—if that is the name of the place.

Q. You didn't know that the tanks were being brought down there?

A. Well I did know, on the way, what we would have to do; but a very short time, I could say, minutes; might have been half an hour.

Q. I understand you are the one that suggested an air test down at Warriner's?

A. Yes, sir.

Q. And did the tanks show evidence of damage from the fire, at that time?

A. They didn't leak as bad as I had expected; but the air test was done with a view to saving a lot of time. When I saw the soldered seam, that I hadn't observed, and realized just exactly how the things were made, I saw that this solder was completely burned off of these tanks; and I predicted that each tank would leak very much more than it did. I suggested that we save time by putting this air test on them.

Q. I see; you had no expectation that it would be successful?

A. The minute I saw the tanks, I had very little idea that it would, but I wanted to be sure; otherwise we never

would have put air on them; because that is not a safe way to test a tank,—that is, up to any appreciable pressures.

Q. Well now then as I understand it, although you didn't expect the test would be successful, you did suggest the test on Number One, Two and Three tanks?

A. Well that was only when I had actually seen the tanks.

Q. Was there any difference between their appearance at that time, and when you had seen them before?

A. Well I had actually put an air test on one tank, you see, and had the opportunity to examine the seams.

Q. Which tank was that?

A. It was the first tank tested,—that we tested; I don't know it by number.

Q. Well what test was that?

A. We put a small—an air test of five pounds.

Q. When was that?

A. And then perhaps a little better.

Q. When was that?

A. The first tank we tested.

Q. You are talking about last Saturday?

A. Yes, sir.

Q. Well now it was you that suggested the test on the three tanks?

A. The air.—No, no, I didn't suggest that the tanks be tested at all, but when I found they were being tested—

Q. Now just listen; it was you that suggested the air test, I understand you to say?

A. Yes, sir.

Q. Why did you not suggest an air test with respect to Number Four tank?

A. Number Four tank had been tested, and what we needed from Number Four tank was a knowledge of whether our prediction of the condition of the tank was accurate, or whether the prediction of the other experts, on

the other side of the case, was accurate. And the principal thing that we desired was actual knowledge of the physical condition of the tanks; because we had been told of the horrible corroded condition of these tanks, that we had been given every scientific reason, with the benefit of experience of experts of years.

Q. Now if you please, Mr. Gibbs,—I don't want to cut you off, but please confine yourself as nearly as possible to answering the question.—What was the question we asked?

(The preceding testimony was read by the reporter.)

Q. We are getting pretty far away from Number Four tank, you realize that?

A. Mr. Matteson, I just wanted to tell you what I understood the purpose of getting those tanks there, was.

Q. All right. Now you realized, did you not, that the prior test that had been made of Number Four tank, was in some respects unsatisfactory?

A. None whatever. I was not here. My criticism of that test was that having gotten two or three times the working pressures, that it was ridiculous to run it up any higher; and, that was most satisfactory.

Q. So you knew that no air test had been previously applied to Number Four tank, did you not?

A. Well I don't think they had any equipment to make it.

Q. Well regardless of that, you knew that no air test had been made of Number Four tank?

A. No I had never heard that it had been.

Q. You were present in Court when Mr. Munroe gave his testimony?

A. Yes, but I heard of no air test.

Q. You knew of no prior air test on Number Four tank?

A. No.

Q. Then what was the purpose of eliminating Number Four tank when you were testing the others with air?

A. It had been tested.

Q. Now when the Number One, Two and Three tanks showed leaks under air pressure of five pounds, didn't that suggest to you the advisability of determining what the condition of Number Four tank might be under similar conditions?

A. No; unless I wanted to dispute the testimony of Mr. Munroe. And I don't recall now whether we had already cut that tank up, or not. But my idea of the whole tank business was to have before the Court, sections of the tank, to actually,—we had the test of Number Four; but to have the actual—the sections of the tank, to show the condition of every single portion of that tank, to the Court, without any more speculation. And I still think that that is ninety-eight percent of the purpose for the removal of the tanks to the place where they could do that.

Q. Did it cause you any surprise that the other tanks gave way under five pounds pressure,—air pressure, when the other tank had stood up under forty pounds pressure? Can you account for that?

Mr. Underwood:

I object to whether he was surprised; object to the form of the question.

Mr. Matteson:

Well I will rephrase it.

Q. You realized, did you not, that when the three tanks showed leaks under five pounds air pressure, that there was a very considerable discrepancy between that result, and the supposed result of the first test, when the tanks are said to have stood forty pounds pressure,—did you not?

Mr. Underwood:

Just a minute; may I have that question read, please?

(The last question was read by the reporter.)

A. Not necessarily. I have built a very great number of tanks, and have had two tanks that looked exactly alike, and one of them will leak and the other one will not. Since the time that Munroe made the test of his tank, to the time that this tank was tested, some different conditions have set in with the tanks. In the first place the boat, those tanks were in a fixed position in the water; well they have been handled some; and that handling might have accounted for very small leaks that did show up; because these little bubbles were not very large.

Q. Then you suggest now that the opening of the seams of One, Two and Three tanks was not due to the fire, but to handling, is that it?

A. Oh no; it was due to the fire, and the fire of course loosened up all the—getting the solder away from them, melting the zinc, and, perhaps putting strains on the tanks.

Q. Well now if the only purpose of bringing the tanks to Warriner's was to cut out sections to be brought to Court, why did you suggest air tests?

A. You mean when they got to Warriner's?

Q. Yes.

A. Well that was a quick method, what we usually do to the tanks, we will take a tank that is just finished, and rather than fill it full of kerosene, oil and then have to take that out,—that is a hard job; we usually shoot small—a very small amount of air to it, and then if that shows a leak, we can instantly repair it. When it shows no leaks under air, then it is safe to put your test later, under oil.

Q. You don't think your purpose would have been sufficiently served after cutting out the sections, without performing an air test first?

A. No, I saw no—my purpose in taking the tests, of testing the other tanks, they seemed to be exactly alike, and if Munroe had run the test and got those things, I saw no purpose in testing the other three. I don't know what Mr. Underwood had in mind; he didn't tell me. But I thought myself that these sections were vital, that they would eliminate further argument respecting the tanks.

Q. Will you describe to us the caulking that you saw on these tanks?

A. The caulking was such caulking as would be done on a tank of this kind; with the knowledge of the completed product.

Q. Now I didn't ask you to tell me that, Mr. Gibbs; I asked you to describe the caulking that you saw on these tanks.

A. That is a description of it, sir.

Q. Well it doesn't mean anything to us, because we are not familiar with what you may be familiar with. Please give me a physical description of the caulking that you saw on the tanks.

A. All right, sir. It was a small trench between the plate and—one of the plates and the edge of the plate that was fastened to it,—made by a tool.

Q. You saw an opening there?

A. No, sir, a trench, where the metal—the edge of the metal was mashed in the plate.

Q. And what was the width of this trench?

A. I would say that it was about, oh somewhere between a thirty-second and sixteenth.

Q. Did it go all the way down the vertical seams?

A. It went pretty generally everywhere; it doesn't always have to be even.

Q. You say then that it wasn't everywhere even?

A. I say it does not necessarily,—a caulked seam can be absolutely something you can't see. You have a big tool, you press the whole end of your plate.

Q. Then do I understand that you saw what you considered evidence of caulking, in places, and assumed that it continued in other places?

A. No, no.

Q. Well do you say that you saw—

A. I saw evidence of caulking all over the tanks, except the top crown.

Q. And where was that caulking that you saw?

A. Between the plate and the plate to which it was attached.

Q. Was there any caulking on the outside of the seam?

A. Yes.

Q. On all the tanks?

A. Yes, sir.

Q. Unfortunately the light doesn't show too well here, but can you show us any evidence of caulking?

A. Couldn't on that picture.

Q. Was it caulked there?

A. Yes, sir.

Q. Was it caulked in the way of this irregularity in the shear, that appears?

A. Yes, sir.

Q. I am referring now to Libelants' Exhibit 154.

A. Yes, sir.

Q. Now what you observed, I take it, was an opening between the outer plate and the inner plate, which you call the trench; is that it?

A. Yes; there was some places I can't tell you just which tank it was, where it was; right under the plate.

Mr. Botts:

An illustration here doesn't get into the record, and takes up useless time; the Judge won't understand it, and even if we all understood it, it wouldn't help. I didn't want to stop you, but you can see the point I make.

A. Yes, sir. May I build this tank for you and show you just how it is caulked?

Q. I don't want you to build this tank, but I want you to describe this caulking that you saw.

A. All right. When the two plates are riveted together, they may or may not cut at the edges, depending upon how flat those plates are, and how thoroughly, firmly, they are drawn together. An iron that is flat on the ends, is pressed against the edge, with a view to crimping or mashing the metal to a point where it touches.

Q. All right, now that trench, or whatever it is, is filled as I understand it with the crushed metal?

A. Yes, and it does not necessarily have to show as a trench.

Q. All right.

A. I could make a drawing of that if you would like to see it.

Q. Well as I understand it, where that caulking appears, you have what appears to be an opening between the plates, but it is really the result of metal being crushed down from the outer plate, and between the plates, making a seal, is that right?

A. Yes. I will make a drawing—

Q. No I think we have got it all right. Well if that were true, if a knife were inserted into such an opening, it would necessarily strike the surface of the caulking, would it not?

A. No, if the knife was inserted, it would indicate that some forces,—heat or quenching, had buckled the whole plate away and torn the caulked edge away from the plate it was supposed to be caulked to; the breaking of a rivet, the release of the tension that draws a plate together, will take a caulked edge and pull it away so that a knife can be put underneath it.

Q. I understand you to say these tanks were caulked in all their seams, at least their side seams; is that right?

A. I said, I found evidence.

Q. And is that your opinion, that they were all caulked?

A. Yes.

Q. How can you suggest any reason why, if they were caulked, they should also be soldered?

A. Because they were supposed to hold gasoline, and because it is the usual way to build tanks of this kind.

Q. Do I understand you to say that caulking alone is not sufficient to hold gasoline?

A. Caulking might be done in a heavier tank than this, in a way that would hold gasoline; but with this gauge, the caulking is done to minimize the—to increase the strength of the tank and the tightness of the tank; and that, in connection with solder, makes a most excellent job, which is usually done.

Q. Well have you built tanks in your yard?

A. A great many.

Q. And do you always caulk and solder them?

A. Almost universally, with a tank of this kind. This is a pretty heavy gauge tank for gasoline.

Q. This is a heavy gauge tank?

A. A very heavy gauge tank.

Q. And yet you say it is not heavy enough for caulking?

A. What is that?

Q. You say it is not heavy enough for caulking?

A. I say it comes in between,—if it were a sheet metal, for instance, we wouldn't caulk it at all, we would put rivets very close together and do what you call, tin all the seams.

Q. By sheet metal—

A. I mean thinner gauge,—I would say twelve gauge or ten gauge.

Q. What does twelve or ten gauge mean?

A. Somewhere around an eighth of an inch. When I said, ten gauge,—ten gauge and thinner, I mean a higher gauge; ten towards twenty.

(Following discussion as to meeting between counsel and witnesses at 8:30 o'clock A. M. on the following day, at Warriner and DesRocher's, at 9:46 o'clock P. M., hearing was adjourned to be resumed at 9:30 o'clock P. M. on the following day, to-wit, November 22nd, 1939.)

Wednesday, November 22, 1939, 9:54 o'clock a. m.

Hearing was reconvened pursuant to adjournment of the previous evening.

Mr. Botts:

I am going to make a statement, and if it is not in accordance with agreed facts, let's get it changed. This is with reference to these new pieces cut out, so as to get them marked. The segment of metal marked in red paint, 4-A is a segment from the side wall, including one of the side seams, of Tank Four, cut from about two feet below the top head, and was cut out at a point marked by Mr. Gibbs.—That the segment 4-B was also cut from Tank Number Four, at a point on the side seam opposite the seam from which segment 4-A was cut, and was cut at a point starting approximately sixteen to eighteen inches above the bottom of the tank.—That segment 4-C is a part of the side wall and crown sheet, crown piece, of Tank number Four, and was cut out including the rivet hole from which one of the rivets marked in evidence was driven, and is one of the rivet holes concerning which testimony was previously given.—That segment 4-D was cut from near the bottom of the side wall of Tank number Four, and includes that part of the side wall, including the seam, that runs down to within approximately an inch to two inches of the bottom of Tank number Four.—That segment 2-A is a segment cut from the side wall of Tank number Two, and includes the segment of side wall of Tank number Two which is shown in Libelants' Exhibit 154, but includes some area in addition to that shown by Exhibit 154.

Mr. Underwood:

You will have to count the rivets to be sure of that, Mr. Botts; I don't know.

Mr. Botts: (Continuing):

Eighteen; there are eighteen rivets; and there are (counting)—eighteen rivets here.

Mr. Matteson:

That is, eighteen rivets shown in the photograph, and eighteen rivets shown on 2-A?

Mr. Botts:

Yes; but you can see that the—

Mr. Underwood:

You don't need to tie it up with the photograph, so it is the same general portion.

Mr. Botts:

All right, and instead of "is the same";—includes the same general area of the tank that was exhibited by Exhibit 154; because it goes further this way, and not so far this way.—Let 4-A be marked 156; 4-B, 157; 4-C, 158; 4-D, 159; and 2-A, 160.

(The said sections of metal were admitted in evidence and filed as Libelants' Exhibits 156, 157, 158, 159, and 160, respectively.)

4456 Thereupon: MR. GEORGE W. GIBBS resumed the witness stand and further testified as follows upon continued:

Cross Examination.

By Mr. Matteson:

Q. Mr. Gibbs, we have had some discussion here about caulking. Will you describe for us briefly your idea of what caulking is?

A. Caulking is a means of drawing the edges of plates together, in a riveted vessel, metal vessel—of various degrees, depending upon the purpose of the caulking and the ultimate product of which caulking is part.

Q. See if I understand you: if you have two plates that are riveted together, and you want to caulk them, you take a caulking tool, which is something like a chisel, with a broad, sharp edge—is that right?

A. Usually a square edge; various kinds of caulking edges.

Q. And in order to caulk, you take the outside edge of an exposed plate and—you apply the caulking process to the exposed end, or the end of the outside plate?

A. To the point between the two plates, at the line where the two plates should touch.

Q. Well of course if you inserted a wedge between the two plates you would pry them apart, wouldn't you?

A. Depending upon the nature of your iron. Most irons are made square, without any taper to them, to prevent just that. But often you will drive the edge of one of the plates right down into the crack.

Q. That is what I am getting at. The caulking process is applied to the edge of the outside plate, and the effect of it is to force a part of that edge down against the other plate and into the crack; is that right?

A. Against the other plate. It may not be into the crack at all. You may have a perfectly flat plate up against another plate, in which case you will drive the entire edge of the plate—foreshorten it or spread it, mushroom it, so that the entire edge is widened, and therefore made of a size which causes it to touch the other; depending upon the pressure to be held, which method was used.

Q. Well then, let me see if I get this right: Do you sometimes use a caulking tool that is the full width of the exposed—or full thickness of the outside of the exposed edge?

A. It wouldn't make much difference about the tool. If you were doing that kind of caulking, it would be best to have a tool as wide as the edge of the plate; sometimes it is wider; but it would depend upon the thickness of the plate, of course. A half inch plate, you wouldn't have a tool that wide.

Q. Well let's talk about a $3/16$ ths plate; and I am asking you now, in the light of your experience as a ship-builder, in caulking that plate, would you take a tool that was the full width of the plate?

A. You mean, on these tanks?

Q. Iron work, and these tanks.

A. You might do it, but it wouldn't be necessary. While it appears to the eye as the mashing of the entire plate, it is often just a portion of the entire plate. I can draw a picture, and would like to do it, to show you.

Q. Will you do that—illustrating the caulking, and apply it to a $3/16$ ths plate?

A. (Drawing) That sketch shows the condition of the plate, ready to caulk.

Q. That is the upper?

A. The upper.

Q. Just mark that with the letter A opposite it, so we won't have any doubt about it.

Mr. Botts:

Draw an arrow.

Mr. Underwood:

You may as well mark the other, B, now.

Q. Mark the other one, B. Now what does B represent?

A. B represents the plate when it has been caulked.

Q. And where is the point of contact as produced by the caulking? Just draw an arrow indicating that.

Mr. Botts:

C.

Mr. Underwood:

Mark it C.

Q. Now how is the change between the two positions of the caulked plate, brought about? Will you illustrate that?

A. Metal that was in this section —

Mr. Botts:

Mark that D.

Mr. Underwood:

Just etch it first; shade it, or something. Draw an arrow to that and mark it D:

A. The shaded section, marked D. The metal between the shaded line and the full line has been pushed over to where it assumes this shape.

Mr. Underwood:

Indicating the point C. May it be understood, before we go farther, that this is not to scale, and perhaps is exaggerated?

A. That is exaggerated.

Q. What does that you have just drawn, illustrate?

A. This is a section.

Mr. Botts:

Referring to E.

A. E is a section, FG.

Q. Well A is also a section, is it not?

A. On A—these are the same sketches; one is after caulking, the other is before caulking. This is an ex-

aggregated view of the way the plates might lay together when they would head caulking.

Mr. Underwood:

Referring to E.

Q. Referring to E?

A. Yes. This is only one rivet; there would be others.

Q. What I don't understand is what you mean to illustrate by E that is not already in A.

A. You would necessarily get these if you take it, to make a good sketch of it. (Drawing additional rivets) That is a highly exaggerated picture of why the caulking is necessary at all; where the edges of the plates do not lay down. For instance at point Q, the plates are in contact; at point N they are not in contact. It is such a point as this, only on the edge of one of the plates, that there is no contact such as is shown at D in Sketch A. At such a point that end of the plate would be—could be mashed in and made to assume such contour as shown in Sketch B, causing the point C to come in very firm contact with the bottom plate.

Q. Mr. Gibbs, before we lose this point, it is because conditions such as you have illustrated in Sketch E, where the plates do not lie absolutely tight together, are frequently found, that you use the caulking process; is that it?

A. It is because plates do not—are not theoretically plane surfaces, and therefore subject to leaks; and because you are able to put a terrific pressure, or seal, by the use of the caulking iron, that the caulking iron is used. You have the strength of your rivet and your beam action of your plates, and on top of that you put, with a terrific pressure in a very small point, a seal that tends to almost knit the metals together. You might have two perfectly plane plates that would fit together; you might

draw them together with rivets; but if you had a sufficient pressure, it would be advantageous to seal at this point.

Q. And it is because—

Mr. Botts:

At 'this point', referring to point C.

A. To point C.

Q. And it is because these conditions illustrated by Sketch E are apt to occur, that you use caulking to make tanks tight; is that right?

A. Not only that; it is because you are desirous of having at some sealed edge, a metal pressure point, which might be considered a gasket, integral with one of the plates.

Q. Something you can depend on to make the seam tight?

A. Well it is like a rubber gasket, or a gasket on an automobile head, or anything of the kind. You want continuous, around the area of the leak, point of contact, a pressure higher than the pressure would be if you distribute it over the entire joint.

Q. I get it.—Now will you mark this sketch.

(Said sketch was admitted in evidence and filed as Libelants' Exhibit 161.)

Q. Now you are familiar with the term 'butt' as applied to caulking, are you not?

A. I am familiar with the term, butt, as applied to boiler making and tank making.

Q. Well, put it this way: you are familiar with the term 'crease in the butt' as applied to caulking, are you not?

A. I know what crease in a butt, is.

Q. Let me put it this way. I gather from this sketch, that this shaded area which you have indicated on Sketch

A—and before I go any further, will you just draw an arrow so we will know where it begins; just draw an arrow indicating the upper limit of this displaced metal.

A. (Witness marks.)

Q. And we will mark that X; the metal is displaced from. Down to the bottom of the plate, is that right?

A. Yes, sir.

Q. And that on a 3/16ths plate would be about half the thickness of the plate, would it?

A. It depends upon the pressures that it is to hold; depends on several things, as to what you would do.

Q. Well I am talking about tanks.

A. The ones that we were looking at?

Q. Tanks constructed for that purpose. That area from X to the bottom plate would be about half the width of the plate—about half the thickness of the plate?

A. Not necessarily.

Q. Well you are familiar—

A. In this particular thing, in that sketch it is shown, it would undoubtedly go as high as X, and might go all the way to the top of the plate. It would depend upon the amount of metal that we would need, and that would be determined by the caulker's judgment. He may go all the way to the top; or if the plates practically touch each other, it would only be necessary to displace a small amount of metal at the lower corner of the plate.

Q. Well now I take it that when a plate is caulked, an area such as you have indicated by the shaded area on Sketch A, on the side of the plate which is caulked, the metal is displaced and forced downward toward the other plate.

A. That is true, and I have shown it in a way that it could be done without defacing, to the eye, the appearance of the end; and there are other ways to do it: that is one way.

Q. Well now the area where that metal is displaced and forced over against the other plate; is usually called the crease of the butt, in caulking, is it not?

A. You might—I think what you referred to there, the crease, is where you actually get both; taking some of your metal out of this plate, it is possible to do—

Mr. Underwood:

Indicating the lower plate on Figure A.

A. Without putting this on the record, if you like—

Mr. Underwood:

No.

Q. Let's keep as close as we can. Well the area in which the metal is displaced, is sometimes referred to as a crease, is it not?

A. You could call that a crease; I never heard it called a crease.

Q. And it is called a crease because the metal is displaced, making a depression, is it not?

A. I have never heard it called a crease.

Q. Have you ever built a ship to Lloyd's Specifications?

A. Not that I remember.

Q. Have you ever repaired ships subject to Lloyd's Specifications?

A. I have repaired them, with a Lloyd's inspector present; but whether the repairs were Lloyd's specifications or not, I don't know.

Q. Well you have repaired to the specifications of the American Bureau, haven't you?

A. Not entirely; I have repaired them under the instructions of the American Bureau inspector, but not to American Bureau specifications to my knowledge. I have built them to American Bureau specifications—wooden ships.

Q. Well then you are familiar, I take it, with this provision in the American Bureau Rules with respect to caulking water-tight work, which reads: Caulking of

water-tight work must be thorough; light or superficial caulking will not be accepted; the score or crease in butts is to be of ample width and well set in.—Are you familiar with that provision?

A. I don't call that a provision at all. It simply states that the work must be well done, and there is nothing specific about it at all.

Q. When it says, Crease of the butts is to be of ample width and well set in,—what does that mean?

A. I regard 'ample width' as an indeterminate term.

Q. What does 'well set in' mean?

A. That is still an indeterminate term.

Q. What does 'set in' mean?

A. Set in—it means, driven tight.

Q. 'Set in' would mean that the edge of the plate must show a proper depression, isn't that right?

A. If driven strong enough, it will. It would depend entirely upon the purpose of the caulking. For the building of an American Bureau ship, that is probably true; but building of a solder-edge tank, the purpose of caulking has another purpose.

Q. Will you draw us on this sheet, a picture of a caulking tool?

A. I would like to state that when this edge goes in here, it might go quite firmly enough to actually depress this plate.

Mr. Underwood:

Indicating the lower plate on Exhibit 161, at the point C.

A. Might embed itself at point C; but the thing that holds it tight is its pressure.

Q. Will you draw us a picture of a caulking tool?

A. There are many caulking tools.

Q. Now will you explain what you have drawn for us?

A. That is a picture of one form of caulking tool, and this edge is rectangular, it is tilted slightly back, and brought away from the tank—as applied to the tank.

Mr. Underwood:

Indicate that; just mark it A.

Q. You have two sketches of the tool; mark one A and one B.

A. This is plan, and this is elevation.

Mr. Underwood:

How about marking that, drawing an arrow to that?

Q. Indicate the caulking edge on the sketch.

A. Well the caulking edge is here.

Mr. Underwood:

Just mark 'caulking edge' between those two arrows.

A. Put that A; maybe I can describe it better.—A and B.

Q. The caulking edge on the elevation—

A. As A to B; and the lower one:

Mr. Botts:

Suppose you mark the caulking edges on the plan.

A. That's the same.

Q. Now just write 'caulking edge' underneath those lines, so any one looking at it will know the meaning. Caulking edge down there, isn't it?—Now Mr. Gibbs, the caulking edge in the elevation, as applied to any particular plate, you would use a tool less than the thickness of the plate, would you not?

A. You might; you might not.

Q. Well I am talking about the usual shipyard practice, with which I take it you are familiar; caulking a plate

for a tank, such as the Seminole, would you use a tool less than the thickness of the plate?

A. Less than the thickness of the plate? You might. You have several tools where you build your tanks; you might have a large tool, it might be bigger than that, that could bring about what you want.

Q. Well now may I ask you this; if you were to look at—you had better mark that.

(Said sketch was admitted in evidence and filed as Labelants' Exhibit No. 162.)

Q. If you were to examine the seam between two plates for the purpose of determining whether it had been caulked or not, what would you expect to observe as evidence of caulking?

A. I would observe—I would want to know several things. One is the history of the plate, since it was caulked.

Q. Well I am asking you, Mr. Gibbs, Mr. Gibbs, this: You look at a piece of work that you never have seen before, and you don't know anything about the history of it; how would you determine whether it had been caulked or not?

A. By examining it, and the first thing I would look for would be the edges of the plate.

Q. What do you mean by that?

A. I would look for the edge of the plate where it touched the other plate, and if I found that it did, to a marked degree, I would look further for evidences of the use of an iron. Failing to find it, however, would not permit me to say that the plate had not been caulked.

Q. Well—

A. I would then look to see if the edge of the plate was vertical or normal, to the plate that it touched; if I found that it bent inward, that line, it would be very good evidence to me that it had been caulked.

Q. Well let me put it to you this way. It is a fact, is it not, that caulking by its very definition involves deformation of the original edge of the plate that has been caulked?

A. Quite true, sir.

Q. And what is the deformation?

A. It depends upon its original formation. It is a change in form. You might put a plate that was actually cut on a slant, and your caulking iron might leave it vertical; it has been deformed from its original place, but it would be impossible to state—looking at the plate, that its condition at the time you look at it was not a deformed condition of the plate.

Q. Mr. Gibbs, will you explain to us at some length, your experience, in shipbuilding?—Do I understand you to say that in looking at a piece of work, you would not be able to say, in view of all your experience, definitely whether it has been caulked or not?

A. I think that in nearly every case, that I could; but there was a case down there today, when half of the people that looked at it, said it hadn't been caulked, and I am willing to swear that it has been caulked: a piece of work that has nothing to do with this. One half of them looked at it: and it was due to the fact that there were no scars left by the caulking iron.

Q. You are referring to something entirely unconnected with the Seminole, now?

A. Just as unconnected with shipbuilding in general, as unconnected with this.

Q. Let's get to these exhibits. Exhibit 4-A:

Mr. Botts:

That is 152, isn't it?

Q. You will recall, Mr. Gibbs, I believe, that I asked you to point out and mark with chalk a section on the inside seam of tank number four, as it laid in Warriner's

yard, this morning, where you were willing to state that the inside seam had been caulked. That is correct, is it not?

A. I think you did; yes.

Q. And you did point out and mark such a seam, did you not?

A. I did take at random, without light, a section of the inside of the seam. I was under the impression from what I had seen that the entire seam had been caulked.

Q. Well now the purpose of our visit down there this morning was so that you would point out and show to us a seam which you said had been caulked; and under those circumstances you did point out to us and mark, a section of the inside seam of tank number four, did you not?

A. Umh hmlh.

Q. Is that right?

A. Well, I did—

Q. Please answer me Yes or No, and if you want to qualify it you can; afterward.—Will you read the question?

(Fourth question on this page, read by reporter.)

A. Yes.

Q. And this Exhibit 4-A, or rather 156, is that section of the inside seam of tank number four, cut out as marked by you, is it not?

A. I would say that this seam has been caulked.

Q. Well now that was not my question.

(Preceding question read by reporter.)

A. Yes, sir.

Q. And before you indicated the seam, you used a wire brush to clean it so that you could get a good view of it, did you not?

A. Yes, sir.

Q. And you don't suggest that you didn't have every facility for picking out what you wanted to pick out, do you?

A. Well, I could have had the lights if I had called for them; but I did not have when I picked that out.

Q. You were satisfied with the seam?

A. Yes.

Q. Now the inside seam is on the side of the plate where the heads of the rivets are quite round, is it not?

A. That's right.

Q. Now do you say that inside seam has been caulked?

A. Yes, sir.

Q. Will you point out to us what evidence there is on that inside seam, of caulking?

A. Give me a rule. The plate, in spite of the fire and the corrosion of the heat of this morning, after I clean it, shows very close adhesion at the point—shows that that point is extremely close, the lower edge of this plate is extremely close, to the wrapping plate. It also shows that it is not level, but apparently there is metal gone, and it has been pushed in, as is shown by my sketch over there.

Q. Of course you are dealing with a curved plate, there?

A. Oh yes; with my eye I make allowance for that.

Q. Then as I take it, the only evidence that you can point out to us on the inside seam of this plate, that the seam has been caulked, is that the two plates are very close together, and that you say—

A. They are dished in.

Q. And you say the angle of the edge of the overlapping plate is not perfectly perpendicular to the tangent of the cylinder? Is that what you say?

A. Yes, sir; and that is quite marked.

Q. Now I will ask you to look at this outside seam, the reverse of the same Exhibit; tell me whether that has been caulked.

A. I think it is quite evident that this has been caulked, with a different kind of iron.

Q. Well now point out to me—

A. There is evidence of what has been described in your questions as a trench.

Q. Now will you point that out to me?

A. Right at the point where the lower edge of the enwrapping plate is marked—as traced by this lead pencil.

Q. Well couldn't that be, Mr. Gibbs, that the plates are simply not closely in contact at that edge?

A. I did not think so; because that is a normal process or step in the manufacture of that gasoline tank.

Q. Well then if this plate were cut apart very carefully, you would find very clearly on the under side, a deformity of the outside edge, would you?

A. I don't think you would have to cut it apart to see; I think that shows with the naked eye.

Q. If it were cut apart, it would show very clearly, would it not?

A. It would show perfectly clear there; it wouldn't show any clearer than it does right there.

Q. You say there is a mark of a caulking tool here?

A. I think so, sir; that is with a finer cutting edge than the other.

Q. And what would you estimate to be the width of the crease on this edge?

A. About a 32nd.

Q. Then that would have to be made with a tool a 32nd—with an edge of a 32nd of an inch thick, would it not?

A. Certainly not.

Q. Why not?

A. It could be made with one—with the proper angle—

Q. It might be made with that one right there?

A. Made with a portion of the distance from A. to B., in Exhibit 162.

Q. All right, let's pass to the next exhibit, 137. I think you have testified, or you told me this morning, that the entire outside seam of the number four tank had been caulked, in your opinion; is that right?

A. Yes, sir.

Q. And you recognize this exhibit 157 as a piece cut out along that seam which you said had been caulked, is that right?

A. Let's see. (Witness goes to window.) (The question was read by the reporter.) Yes, sir.

Q. And do you now say that the outside edge of the seam which appears here in 157 has been caulked?

A. Yes, sir.

Q. What evidence do you see of that?

A. The evidence, just as the evidence on the other plate. The close contact with the outside plate to the lower plate, in spite of the effect of the fire, and erosion of the elements; and what appears to my eye to be the actual marks of a caulking iron; and also the fact that the plate seems longer at the top, the enveloping plate seems longer at the top than it does from a fixed point at the bottom, or the edge, which touches the plate which it envelops.

Q. Now, on this Exhibit 157 I think you cited as evidence of caulking, the opening between the seams, did you not?

A. No, it was the V-shaped place I think that was caulked with a different kind of caulking iron.

Q. Now these are similar seams from the same tank. You say that different caulking irons were used on these two seams?

A. Entirely possible, that two workmen worked on the tank; I expect six or seven worked on the tank, and each one would take his own tool and caulk in his own way.

Q. You would have six or seven caulkers on one tank?

A. I didn't say that; I said probably six or seven men worked on those tanks.

Q. Well I don't want to be unfair in any way, but my impression was that you cited on Exhibit 156, the opening between the tanks as indicating caulking. Now on 157 you cite the fact—

A. I didn't say, the openings.

Q. That the plates are close together, as evidence of caulking. Am I wrong about that?

A. Yes, sir.

Q. Anyway, you are prepared to swear now that Exhibit 157 has been caulked on the outer seam?

A. To the best of my knowledge.

Q. Now as to 158, you recognize this as a section from the top of tank Number Four, including the portion where one of the rivets, which has been referred to in evidence, was cut out?

A. Yes, sir.

Q. And do you say that that seam has been caulked either inside or out?

(Witness goes to the window.)

A. I do not think that this piece has been caulked. If you will recall, this piece was taken out to show a rivet, and I did not look at the place.

Q. Well now will you point out to us what difference there is between the inside seam on this Exhibit 158, and the outside seam of 157—or rather, strike 157, and say the inside seam on 156, which shows the difference?

A. Yes, sir. In the first place the running down of the caulking iron down that edge tends to true up the seam, to knock out the high points, and make that appear to be a straight line, as you will find it in these other exhibits. In this particular exhibit you will find that it is most irregular, and there is no indication that a straight edge,

such as the edge of a caulking tool for practical purposes is, could have actually gone over the edge of this plate without tending to true up the noticeable irregularities in that edge, due to the shear.

Q. Mr. Gibbs, you did examine the inside circumference of that seam, and you did find a place on that seam which you considered was caulked, did you not?

A. Yes, sir, several places, and I assumed the whole business was caulked.

Q. Well is it your testimony now that the inside seam of the upper part of the circumference of tank Number Four was caulked in some positions and not in others?

A. It is possible that it is caulked where it was apparent that the caulking was required. It is subsequent, it may be even possible that some caulking was done here since; but since I've viewed the inside circle, there has been some heating applied in the taking of that off; and there is another thing that caused me not to see that at all, when they drove that rivet up they deformed the inside plate, stretching it in length, tending the whole thing to draw at that point and make it draw away from the shell.

Q. Well granting that there has been some displacement in the way of a hole, and possibly as far as the rivets on each side, the distance of the two rivets on each side, there has been no effect from driving out that rivet, has there?

A. I can't tell you just how far that would go back, without—because I took no measurements of it. But there is unquestionably an effect on the whole seam by the driving of that plate away from its other position.

Q. Well now let me be clear about this: you did observe that a part of the seam from which this Exhibit 158 was taken, had been caulked, did you?

A. Yes, sir, in my opinion it had been caulked.

Q. And in your opinion, this section of 158 had not been caulked?—Answer it yes or no.

A. I will answer yes or no, when I look at it again.

Q. You looked at it once.

A. Where's that magnifying glass you had?—looking at it through that glass, I wish to state that there is evidence that that was caulked.

Q. Well a moment ago you said it wasn't; you have changed your opinion now?

A. I have.

Q. What do you see that is evidence of caulking on that plate?

A. I see evidence of a caulking iron on the lower half of the plate, which shows up under the magnifying glass.

Q. Will you just show us where that is?

A. Right here.

Q. Now you are marking the arrow within an inch of the righthand side of the plate, when you looked at it from the inside, with the crown at the top?

A. That's right.

Q. Now is that the only place you see any evidence of an iron?

A. No, I see it elsewhere on the edge of the plate, even where the edge of the plate was torn away by the heat and drift.

Q. Where do you see it in the place where the plate has been torn away by the heat and the drift?

A. You see that point there, the point there; to where the heat was torn away—there, there and there.

Mr. Underwood:

Opposite the third, fifth and sixth rivets from the right-hand end.

Q. You see those plainly with your naked eye, do you?

A. Yes, sir; I wouldn't have discovered them if I hadn't looked through the glass.

Q. Now you say you see them with the naked eye, but you say you didn't discover them without a magnifying glass; how do you explain that?

A. Due to the fact that this has had doubly bad treatment; first the original fire, with the action of the elements; and the treatment at the Warriner shop, with the straining here, and the heat that was applied there.

Q. Now you are prepared to swear the plate was caulked; is that right?

A. Yes.

Q. Now we refer to this section, Exhibit 160, which I think you recognize as having been cut from the side seam of tank Number Two; is that right?

A. Yes, sir.

Q. Now I ask you to look at this outside seam and tell me whether that has been caulked or not?

A. Yes, sir; I think with my eye that I would say that has been caulked; and also the use of a knife; it had been caulked with a different kind of a caulking iron.

Q. And what would you say was the width of the crease in that caulking?

A. About a thirty-second of an inch.

Q. If this is three-sixteenths plate, a thirty-second would be one-sixth of the width of the plate; is that right?

A. Yes, sir.

Q. And do you say that a caulking tool with an edge a thirty-second of an inch, was used?

A. No, I would say that the edge is a tapering edge, probably with a toe ground on it, to drive in that and fill that—tap that up and fill that so the solder would not run.

Q. Can you tell us whether the inside seam was caulked?

A. I can't see anything on that, without a thorough cleaning.

(Mr. Matteson cleans joints with pocket knife.)

Q. Now can you see it?

(Witness goes to window.)

A. In my opinion that was caulked.

Q. And what do you see to indicate that?

A. I see a very great deal of injury due to the element of fire, but I distinctly see the close connection between the lower edge of the plate and the enveloping plate, except where it might be accounted for by the distortion by flame,—by fire. It seems to me that it is smoother, considerably smoother on the contact edge, and that that has receded in position from the outer edge of that seam—that plate.

Q. Now here is Exhibit 159, which is a section cut from the side of tank Number Four, a part of that tank which had been previously cut off prior to this morning. Do you recognize this as a section that was cut out of the bottom part of that tank, bottom part of the side of that tank,—at your request, was it?

A. It may be; I think it was Mr. Munroe's request, but it might have been mine,—or Mr. Underwood's or mine. I don't recall.

Q. Well I call your attention to the inside seam on this section of the plate; do you say that that has been caulked?

A. Yes, sir, very definitely, this being cold, as evidenced by the solder—traces where a caulking iron are much more pronounced.

Q. Referring again to Exhibit 158, you notice this segment of iron is parted from the shape of the crown just below the rivet hole; that is very evidently an error in shearing, is it not?

A. Yes I think that is.

(Brief informal recess was had.)

Q. Mr. Gibbs, do you say that the bottom seam of the tanks was caulked?

A. I don't think I could determine that. There has been no testimony that I remember on the caulking of the bottom seams.

Q. Well can you say whether the bottom seam was caulked or not?

A. Have we got one?

Q. I will show you one in just a minute. First I want to ask you whether you can say—

A. No, sir.

Q. Then I will show you Exhibit 5-Z and ask you whether the bottom seam there is caulked?

A. I would have to have the solder off of it.

Q. Could you determine by the under section?

A. There is too much solder in there now.

Q. Well the solder can be cut out if necessary.

A. Burn it out.

Q. As a matter of fact I think it has been entirely removed from this end. Now do you say that this end section to which I call your attention, is obscured by solder?

A. I wouldn't—I wouldn't want to say anything about that. Cutting that solder with a knife—from what you can see, from the small amount exposed by your knife, I think it is quite evident that that seam is caulked.

Q. That it was caulked?

A. Yes, sir, I think that is quite evident.

Q. Just show me what the evidence of caulking is, there.

A. The evidence is that when the iron went in between the edges of the plate, that it actually bent that plate outward. This runs in a straight line and suddenly turns out. The other evidence is that it seems to be trenched right down there, where the caulking iron actually has gone in there.

Q. Well let's see if we can get it clear.

Mr. Underwood:

Indicating the right angle between the bottom of the side plate and the bottom crown of the tank.

Q. Just so we will be definite about it, I am holding this exhibit in really what is an upside-down position, so

that the rivets are at the top, and the bottom of the tank is at the top; and I am referring to the right-hand edge as we look at it in that position: and here at the right-hand edge where the solder has been recently well cleared away, you say you see that there is evidence of a trench made by a caulking tool at that point?

A. Yes, sir.

Q. If you look at it under the end section exclusively, you don't see that, do you?

A. Well that may be the solder, Mr. Matteson. (Witness goes to window.) The fact is you see the knife would run right down there. A tool will make a trench.

Q. You can make a trench in steel?

A. That is true; I don't want to cut it, but I could cut that place; apparently the knife ran right into it. If you burn that off I can really give you an idea of what the appearance is. You don't have to heat it too hot, just enough to melt the solder.

Q. All right. Now there were two rivets that were burned out of tank Number Four under your supervision were there not?

A. Yes, sir.

Q. And the rivets toward the lower part of the seam on that tank, when it was cut out—when it was forced out, made quite a belly in the iron at that point?

A. Yes, sir.

Q. Now the other rivet, was that cut out to your satisfaction?

A. No, sir.

Q. What was wrong with the cutting out of the other rivet?

A. It was an improvement over the original try; of the outfit who did the cutting; but their flame, the single flame was a wider flame than would be used in that particular job. And at no time would we dream of cutting a rivet out of that end of the tank, unless the other end of the tank

had been removed; so that we might have gotten under there to put some brace under the material,—under that head.

Q. Well the tank—the other end had been removed, hadn't it?

A. What is that?

Q. The other end had been removed, had it not, when that rivet was cut out?

A. It might have been. What we were trying—I was trying to illustrate to Mr. Underwood at the time, was the fact that the acetylene torch could take from the rivet all of its strength without even destroying the edge of the rivet. I was trying to show him that a hole could be cut down in the center of the rivet, right through the head, without even injuring the rivet itself.

Q. And did you do that?

A. Not to my satisfaction, because the man, although he became more proficient, apparently had never done anything of that kind.

Q. In other words, you say the man at Warriner's yard, that you employed for this, was unskillful; is that it?

A. In the removal of rivets I would say that he was unskilled in that particular thing. I think he could have been skilled in thirty minutes of practice with the tool.

Q. Will you describe to us the cutting out of the rivet at the top of the tank?

A. Well, do you mean, what happened at that procedure?

Q. Yes.

A. He took, without putting anybody under, inside of the tank, with any brace, he simply took his hot torch, and even before adjusting it for the fineness of the flame, he played it on the top of the rivet. It soon came into adjustment and drilled a hole, or burned a small hole right into the rivet. Then he took a hammer,—a drift pin, while the whole mass was still warm, and drove it; and when he

drove it, it was picked up from the other side of the tank, —the head fell right off. He might have knocked the head off with the hammer; I don't recall whether it fell off or whether he knocked it off with his drift.

Q. Well it wasn't necessary to strike a very heavy blow to knock the rivet out, was it?

A. Well it was a pretty fair blow that he had to strike on that rivet. He hadn't gone into it enough to collapse it; he hadn't gone as much as I wished him to.

Q. Did you tell him to go into it further?

A. No, I think we got a sample that would illustrate to the Court what our purpose was in stating that rivets could be turned out without injuring the rivet.

Q. Your purpose was to show they could be driven out efficiently without injuring the plate, wasn't it?

A. Yes; not at that head, though; it was the head that you would have to take out in order to get into the tank.

Q. Now in doing it, you did injure the plate, didn't you?

A. What is that?

Q. In doing it, you did injure the plate, didn't you?

A. That? I think that that existed. We never claimed that these rivets were the rivets that—

Q. I just asked you to point out—

A. That is injured by the process that we used, yes, sir.

Q. Now you do say, as I understand it, that the steel that was used in this tank could have been used in the construction of a boiler of some type, do you not?

A. At no time—

Q. We had some discussion on boilers yesterday, but we got off of it.

A. I said it was entirely possible that the steel was of a quality that would be satisfactory for a boiler. But I did not have the history of the plate,—or the certificates.

Q. And if it were used for a boiler, and considerable heat were applied under it, as is necessary in the case of

a boiler, you wouldn't expect the plates to distort, would you?

A. Read that question.

(The question was read by the reporter.)

A. I would not expect these plates to distort—become distorted, if used in the manufacture of a boiler, if heat were applied to them as it is intended to be applied in a boiler.

Q. Now in this Exhibit 158, where the crown plate has been distorted by the driving out of the rivet, will you look down through the seam where it is opened there, and see if you agree with me that there is evidence of rusting and corrosion there?

(Witness goes to window.)

A. Impossible to say that unless you remove this, and then I would be handicapped by the fact that the heating torch might not only have affected it, but it is heated quite hot.

Q. As you look through that crack that has opened up there, isn't it a fact, through the crack, that you can see rust?

A. What I see is something the color of silver, indicating to me that the galvanizing is still there. (Witness goes to window.) It is whitish in its color.

Q. Do you notice the offsetting of the rivet holes in the two plates there?

A. Yes, sir.

Q. Do you notice some marks where a drift pin has been used, down at the bottom?

A. Well I wouldn't know which drift pin had made those marks; whether the drift pin used by the man who knocked that rivet out, or whether the original rivet.

Mr. Matteson:

That is all.

By Mr. Botts:

Q. But there is evidence of a drift pin distorting those holes, is there, Mr. Gibbs?

A. Well, holes are not round.

Q. How is that?

A. The holes are not round, and some drift pins distorted that hole.

Q. When you used a drift pin to back up these rivets,-- and I show you two rivets, one of which came out of there, the drift pin went inside the drilled or burned out hole in the end of the rivet, didn't it?

A. No, not necessarily. It crushed it; it held the head off here, the head went off, and the drift pin, probably the point went in there; I think that it did.

Q. The point went into that?

A. I think that it did. I don't know. It looks very much like it.

Q. If inserted here, it would have crushed the sides, wouldn't it, if you had been driving against these?

A. Unless the top of the head was in there; but unquestionably some pressure went in there.

Q. Then the point the drift pin was smaller than the rivet hole, was it not?

A. It may have been.

Q. Wasn't it, as a matter of fact?

A. I think it was.

Q. All right. Now then when you drove that rivet out-- when the rivet came out, then the drift pin went on into this hole didn't it?

A. It might have.

Q. After the drift pin went into this hole, did you continue driving on that drift pin?

A. I wouldn't assume that he did.

Q. Well you know as a matter of fact he didn't, don't you? You were there.

A. When a machinist would hit that thing, and when he first hits it if it doesn't come out he hits it a harder lick, in which case the drift pin does all of its harm at that moment; she goes on through, and he has to jerk it out.

Q. And do you think that the blow on the drift pin that drove this rivet out, and at the same time that it drove the rivet out, drove the drift pin into the hole, that the one blow would have been sufficient to show the distortion that there is apparent in that hole?

A. I don't regard that as any great distortion, and I wasn't particularly interested in how far he drove the pin in that, and I am in no condition to testify about it.

Q. The drift pin came in from the top, didn't it?

A. Oh yes.

Q. Then if the drift pin came in from the top and distorted this hole, lengthened it out, could that same drift pin have distorted it on the bottom at the same time, and with this one single blow?

A. Certainly.

Q. Oh, it could? All right.—Mr. Gibbs, it is apparent, is it not, that the holes in the two plates,—that is the side plate and the crown plate, were not lined up exactly?

A. Those two, yes, sir.

Q. Now then would it have in your judgment been possible to have inserted that rivet in the first place until the holes on the side wall and the crown plate had been distorted by a drift pin?

A. Why I think unquestionably a drift was used; in the manufacture of that tank, at that point.

Q. Then wouldn't you say now, in all fairness, wouldn't you say that the probabilities are that the distortion in that hole was caused by the drift pin prior to the first insertion of the rivet, rather than by the single blow of the drift pin—

A. Absolutely, yes, sir.

Q. All right, that is what I wanted to get at; that while the drift pin, in drifting out the rivet, might have distorted to a small amount, the main distortion was caused prior to the insertion of the original rivet; is that it?

A. I think that is unquestionably true, but I don't know.

Q. Now then, Mr. Gibbs, I call your attention now to the two rivets that have been filed in evidence. Do you observe that those rivets, the shanks are twisted at an angle from the head; in other words, that the shanks are not at right angles to the plane of the head?

A. Yes, sir.

Q. And that would be such a distortion as would be caused by going through two holes which were not in line, such as is the case in Exhibit 158?

A. Yes, sir, that's right.

Q. When you punched down those two rivets, they were just taken more or less haphazard in the tank, isn't that true?

A. One was knocked out, and more or less out of curiosity of the man, to demonstrate a prediction that he made that if you tried to take a rivet out of that seam and went to heat it, that the whole tank would give away, you couldn't take the rivet out of the tank unless you had the other head there.

Q. These two particular rivets were not selected by looking at them in advance, and thinking whether the taking of those rivets would illustrate any particular point, were they?

A. No.

Q. They were more or less haphazardly? In other words, for the purpose you are trying to illustrate, the adjoining rivet would have illustrated just as well as the ones you actually selected, wouldn't it?

A. Oh that is probable.

Q. Then from your observation of these rivets, and the fact that two selected at haphazard, both illustrated the fact that the holes in the two plates that had been riveted together, were not exactly in line, would you say that that lack of alignment of holes is typical of the holes throughout the tank?

A. No, no.

Q. All right. Calling your attention to Exhibit 6-A, and as I hold that exhibit with the riveted head of the rivet, or the outside wall of the tank, toward me, and the rivets upward, do you observe the rivets numbered one and two, counting from the left to the right?

A. I would say those were out of line.

Q. Those were much worse out of line than the two that were taken out, aren't they?

A. I can't tell you.

Q. Well let's take rivet number one, is that out of line?

A. Not much.

Q. A little?

A. Very little.

Q. All right. Now then referring to Exhibit 159:

Mr. Underwood:

158.

Q. One five eight, is it?—And the fact that the rivet hole has been elongated or made oval by the use of drift pin, would you say that the shank of the rivet would fill that elongated hole?

A. I would say that if it was put in hot, that it could fill it, or if drawn tight to the head, it could be made perfectly tight.

Q. Do you notice any distortion in the roundness of the rivet shank near the—I believe what is called the snap-head; do you notice any distortion to make that of an oval shape such as would fit and fill the elongated rivet hole?

A. Well I don't know that that is the rivet that came out of this hole.

Q. All right, take either one of them, it is your choice. Is there any oval shape of either of those rivets near the snap-head, which would be—

A. This one is oval.

Q. At the head?

A. Yes, sir, that is oval; it has actual twisting in that shape that makes the cylinder become an ecllipse.

Q. And you are now—or are you willing now to express the opinion that either one of those shanks of the rivets, up near the snap-head, is sufficiently elongated or distorted in an oval shape, that it would have filled the oval shape of the hole from which it came?

A. I don't know that that would have tilted, and I don't know that it would not.

Q. Well you are pretty well satisfied that it would not, by looking at it, aren't you?

A. No.

Q. Oh, you are not; all right; we will leave it that way.

A. In the first place, Mr. Botts, permit me to say, this portion of the rivet—you don't want to know about—which has been burned out, this came on the bottom. You are asking me to base an opinion on something you haven't given me; I haven't got that.

Q. I have given you the rivets that came out of that hole.

A. But you haven't the part that goes—unless you say it didn't. This part, assuming this is the rivet, maybe was one of these, but the part that filled has been crushed and destroyed; the part that would go in here, we haven't got that.

Q. But what about the part that would come on the inside of the tank?

A. You are talking about this hole?

Q. That is what I tried to explain to you that I was referring to the shank of the rivet up near the head that would come into the hole on the inside.

A. This is not oval at all.

Q. Oh, it isn't?

A. No, sir.

Q. Gosh, have I been born blind, all these years?

A. I kind of suspected it. (Witness goes to window.) It is almost, according to my eye, a true circle.

Mr. Underwood:

Let me look; I haven't been on the witness stand yet.

(By Mr. Botts):

Q. Now since we are unable to see it eye to eye, as to the shape of that hole, and your theory that it is round, I am going to ask you to indulge in an assumption: assuming that the hole was elongated or rendered oval in shape, and the rivet head was round, then the rivet head would not fill the elongated hole? That would be true wouldn't it?

A. It might. You must take into consideration—

Mr. Underwood:

I will stipulate it is a round peg in a square hole that is stretched by pulling apart.

Q. What was the answer?

A. Read the question please.

(The question was read by the reporter.)

A. No, sir.

Q. And in such an instance, the tightness of that hole would depend entirely upon the steel caused by the rivet snap-head on one side, and the riveted head on the other, would it not?

A. No, sir.

Q. You mean to say that if you had a round rivet shank in an oval shaped hole, that there wouldn't be an opening in there that would leak?

A. Leak where?

Q. Well—

A. If it leaked around the shank—leak around one-half of the shank.

Q. Then at the point where it leaked around one-half of the shank, the seal of the snap-head on one side and the riveted head on the other, would be all that would prevent the hole from leaking, wouldn't it?

A. No; the seal of the shank on the other side, and the tightness of the fit of one plate, would then—they would then be tight.

Q. Now then taking Exhibit 6-A again, and the two rivets at the left-hand side, to which we referred a moment ago, and which you asserted were—pass through the plate out of line; I will ask you whether or not in your judgment the shank of that rivet made a tight seal within the hole?

A. It could.

Q. You think it could?

A. Oh, yes, sir, if it was driven in there hot, you could have mashed the rivet up in the entire void.

Q. Then the rivet shank would have—would necessarily have been distorted in shape and put into an oval shape in order to do that?

A. To have filled, it would have to fill the shape of the two holes.

Q. I call your attention to Exhibit 5-Z, and the middle rivet of the five in there, and I will ask you if that does not appear that that rivet passes through in a slightly less than a right angle direction?

A. Assuming that these heads are symmetrical, it does.

Q. Then assuming that there is a slight variation from the vertical, in the direction of that rivet, and that the

holes in the two plates were correspondingly out of line, until lined up with a drift pin; then, I am going to ask you to assume this: that as the rivet passed through the shank—in riveting, the shank was not distorted, but remained in a round condition; then isn't it true that the riveted head of the contact or seal of the riveted head on one side, and the snap-head on the other, would be the effective seal of that hole?

A. Against leakage of gasoline?

Q. Yes.

A. No, absolutely not.

Q. Well how would the shank—how would that round shank have filled the full hole caused by lining up those holes with a drift pin?

A. If it were hot enough and long enough it could have filled it; but just assuming that it didn't fill it—

Q. I am asking you to assume that it was not distorted out of round, in the riveting process.

A. Then you would have two places to overcome, and only two, on the assumption—rather, three, plugging a leak. If gasoline reached the void created by a round hole in—a round pin in an elliptical hole, that could have reached the head of either rivet. If those rivet heads were tight against the plate, no leaks could have occurred there. But no leaks could ever have got to the rivet hole, or near it, as the purpose served by those rivets was to clamp the shell plate to the lower crown, and to create a tight joint with the—

Q. Now then assuming that a condition which you have illustrated in Exhibit 161, existed in that plate, so that the rivets did not draw the plates together with absolute tightness, then there would be a leaking down to the rivet shank, wouldn't there,—or might be?

A. If those two plates—there was a void, a crack between these two plates, and the void created by a round shank in an oblong hole, then the protection against a leak

would be the tightness of the heads of the rivets against the outside of the two plates.

(The foregoing answer was read by the reporter.)

Q. Now I understand from your testimony, at the time when you were repairing Exhibit 161, that that condition does occur sometimes, and that the caulking is to guard against that very situation; is that right?

A. What condition occurs?

Q. The condition where the rivets do not pull the plates absolutely tightly together.

A. Well that is where it is suspected the plates are not drawn tightly together, caulking is resorted to.

Q. And you concede that that does occur on occasions, do you not?

A. The tests show; they show up hydrostatic test.

Q. Now then one of these rivets came out of a side seam didn't it?

A. It was my impression, we got several rivets, two or three I think.

Q. Two is all.

A. I think there were more than two, but which ones are which, I don't know.

Q. One of them—I don't know which, one of them came out of the side seam, and one came out of a head seam, didn't it?

A. I believe that is entirely possible.

Q. Then the condition of non-alignment of the two plates being riveted, occurred in the side seams as well as the top and bottom seams, did it not?

Mr. Underwood:

I object to that; asking the witness to draw an inference from the fact—based upon what the question assumes to be the condition of the two rivets.

Mr. Botts:

He is here as an expert, and experts are allowed to draw conclusions; and I am asking him to draw one.

(The question objected to was read.)

A. Read the last part of it.

(The question was reread by the reporter.)

A. With respect to that particular hole,—all other rivets may have been in line, some of them may have been out of line; but those—the alignment of those two holes,—they were not concentric,—didn't have the same axes.

Q. Then a condition of non-alignment occurred in rivet holes from which both of these rivets were taken; that is true is it not?

A. I think that is true.

Q. And one of them came from a side wall didn't it?

A. As I have said before, I don't know.

Q. Well it is stipulated in the testimony that it did. I call your attention to Exhibit 160. You were present there yesterday morning when that tank was rolled over, were you not, and the photograph was taken of that general location?

A. Yes, sir.

Q. And you observed, did you not, that at that particular time, that particular seam, in that location, was leaking, did you not?

Mr. Underwood:

May I have that question?

(The question was read by the reporter.)

A. I have no recollection of having had my attention called to any leaks at that time.

Q. Well did you observe that at that time, with the tank when it was rolled up, that there were beads of water coming out through that seam, along it at various points, in this particular segment of that seam?

A. I couldn't say that, Mr. Botts. I don't like to go around your word.

Q. Didn't you look at that while we were taking the picture?

A. I saw a camera man there, but at the time it was snapped—

Q. You thought we were very secret about the condition of that?

A. No, you told me what you were trying to do.

Q. And you didn't see any leaks coming out of the side seam of that tank, any water leaks?

A. I didn't go close enough to make that investigation.

Q. All right. Did you see water leaks coming out of the side seams of any of those tanks, at any time, whether I was there, you were there, or you and God was there?

A. It seems to me that I did see water rolling out of a seam, whether it was that seam or another one I can't say. It seems to me that I saw water coming from a seam, with no head greater than the head of the water in the tank, which I think would have had some twelve inches or less of a head. It seems to me that I saw it.

Q. Now then are you able to observe that the rivet heads on the inside of Exhibit 160 are not in line?

A. They are slightly out, very slightly off.

Q. And on the outside, that is also true?

A. Yes.

Q. More out of line on the outside than they are on the inside, aren't they?

A. I couldn't say that at all.

Q. You wouldn't?

A. No.

Q. You observe do you not that the rivet heads on the outside, that is the riveted heads, in a number of instances

seem to be drawn away from the plate or to have raised from the plate, if they were ever against it?

A. The outside heads don't seem to have been put down with a set. They seem to be driven, but not have been set.

Q. In other words they weren't tightened down as tightly as they might have been?

A. I wouldn't say that at all.

Q. Well just what do you mean then?

A. I mean just what I have said.

Q. Explain it.

A. That they apparently were not put down with a set.

Q. What do you mean by that?

A. A set is a nicely rounded smooth caulking, that when you drive a rivet with a hammer, drive it up tight, you take a set and then twirl your set and drive it, and it tends to flush the head the throw the edges down. In my opinion, you can get a tighter joint possibly with that kind of rivet, before your set gets to work on it.

Q. The edge of that rivet, then, will you tell me your impression as to that, whether the edge of the rivet—and I refer to rivet number six from the left-hand side of the plate, reading as I hold it, with the figure 2 and the letter A right side up; I will ask you whether or not in your opinion the edge of that rivet is slightly cocked up or drawn away from the metal of the plate?

A. The edge of it, all the way around, is away from the plate.

Q. Now then do I understand you to say that in your judgment that is a desirable manner in which to leave a rivet, or is it better to draw the heads down close?

A. It is not a neat job at all, and what I think, it has the appearance of having been pulled out, and set from the shank out, rather than on this edge.

Q. Now then taking this particular plate in the side wall, since one rivet hole was out of line in the side wall, I will ask you to assume with me that this rivet number six

to which I have referred, in Exhibit 160, counting from the left-hand side as I hold it with the figures 2 and A right side up to me,—I am going to ask you to assume just for the purpose of a hypothetical question, that that particular rivet passed through the plate in other than a right angled direction; in other words, that the two holes were somewhat out of line.

A. A void between the shank and the hole, in both plates?

Q. Yes; then it would be true that in the side wall the entire seal of that hole would be accomplished by the snap-head—by the contact of the snap-head on one side and the riveted head on the other; that would be true wouldn't it?

A. And the pressure of the plate drawing down, the contact to the other plate, in which case you can't get your gasoline through the hole.

Q. Now wait a minute; we will assume for the time being that there is no leak between the two plates. I mean we will assume for the purpose of this, something that appears to be contrary to the fact, because we saw the leaks coming out of there. But assume that there was no leak between the plates, and that the situation was exactly as if you had drilled a hole in a solid portion of this plate, and then put a rivet in there.

A. And the hole was bigger than the shank?

Q. And the hole was bigger than the shank. Then the entire seal would be accomplished by the contact of the snap-head on one side, and the riveted head on the other. That would be true wouldn't it?

A. That is right.

Q. And that is true irrespective of whether it goes through one plate or two, isn't it?

A. Yes, sir.

Q. And if the fact that it passes through two plates, causes an appreciable number of the rivets to go through

at an angle, there would be an appreciable number of holes in which there was only a seal created by the contact of the snap-head and riveted head: isn't that true?

A. That's on the assumption that there is—that the shank of the rivet, contrary to any possible condition, does not touch the hole at any point at all.

(Thereupon at 12:26 o'clock P. M., hearing was recessed until 1:15 o'clock P. M. of the same day, to-wit, November 22, 1939.)

Afternoon Session

November 22nd, 1939; 1:25 o'clock P. M.

(Hearing was reconvened pursuant to the noon recess, and the witness GEORGE W. GIBBS resumed the stand upon continued cross examination:)

By Mr. Botts:

Q. Mr. Gibbs, what character of rivet is in your opinion best suited for water tight or liquid tight riveting?

A. A hot rivet.

Q. Well I don't mean with reference to its manner of use, but with reference to its—

A. Metallurgy?

Q. To its kind. There are different kinds of rivets, aren't there? Aren't there different types of rivets in respect to their shape prior to their use?

A. Yes, sir.

Q. What are those types if you recall?

A. There are so many types; a bonnet-head rivet that I would consider most suitable for gasoline tanks.

Q. What kind?

A. A bonnet-head.

Q. Is that this kind?

A. Yes, sir.

Q. That is the kind that Mr. Thompson referred to as a snap-head rivet?

A. I don't know what he called it.

Q. What is the difference between a counter-sunk rivet, a swell neck, and a plain shank rivet?

A. The counter-sunk rivet would fill where the metal would go in there.

Q. And a swell neck rivet, what is that?

A. A rivet that is somewhat tapered as it goes in; got a wide neck, and the rivet would hold, not only the head would hold, but the whole rivet.

Q. You mean up toward the head, the rivet is somewhat larger than it is toward the end? Is that what you mean?

A. It means that it has a sort of a taper.

Q. Well the shank or shaft tapers?

A. That is right.

Q. And a plain rivet—

A. You didn't say, swell head, did you?

Q. No, swell neck. And then a plain shank rivet would be one that the shank was the same size all the way through its length?

A. Yes.

Q. Now then which type of rivet, in your judgment, is preferable in making tanks to hold liquids such as gasoline?

A. Well I would want a rivet with a head exactly like that.

Q. And so far as the neck, what kind?

A. I would want a good fit on the neck in the hole.

Q. And would you want a plain neck or a swell neck rivet? A plain rivet or a swell neck rivet?

A. Well I think I would take a plain rivet on that.

Q. Why?

A. For the reason that it is a punched hole, and the hole is supposed to be in line; or I assume it is a punched hole, it looks like that.

Q. The hole into which the rivet is placed, is ordinarily slightly larger than the shank or shaft of the rivet, is it not?

A. Oh, yes.

Q. So that the rivet can be inserted?

A. Yes.

Q. Now then wouldn't a—if the rivet was swell neck, as it was pulled tight, wouldn't it tend to fill that hole and make a tighter joint?

A. Well on these tanks—

Q. Let's—

A. Didn't you ask me about this tank?

Q. No, I am referring to a general question at the moment; we will consider the application later.

A. I understand that is a different question from the one you have asked me.

Q. We will get to the specific application in just a moment.—Would you please read the question?

(The third question preceding, was read by the reporter.)

Mr. Underwood:

I object to ~~that~~ unless the type of material being riveted is specified in the question.

Mr. Botts:

Well I am not going to specify any more.

Mr. Underwood:

I think the witness is entitled to be told then that if there are any assumptions he needs to make, beyond those included in the question, he is entitled to state them.

A. On the assumption that you have a round hole, and a comparatively short hole, to place the rivet together, there would be no great thickness, there would be some

advantage in having your material wedge itself into the hole. If you had a very long hole, with two very thick plates, in order to get the taper you would have very little to head up, if you jam it on the other side of the hole, with your swell neck rivet.

Q. Then as I understand it, where the plates are relatively thin, a swell neck rivet is better than a plain shaft rivet; and where the plates are relatively thick, a plain neck rather than a swell neck is preferable; is that the distinction?

A. That might not be the general rule, but there are other factors entering into it. If the holes are in perfect line, a swell neck rivet will probably take less work in setting it up, and save considerable in labor, with two thin plates.

Q. In your judgment, where the plates are relatively thin, would good practice require the use of swell neck rivets?

A. Certainly.

Q. You think either would be suitable?

A. Oh, yes.

Q. But the swell neck would be somewhat better, is that it?

A. If the plates are relatively thin, and if they are made as most tanks are, where they don't necessarily register, the swell neck rivet would not lend itself to the filling of both sides as readily as the straight shank.

Q. In other words, "if the holes didn't jibe"—that is what you mean by not registering?

A. Yes, sir.

Q. That if the holes don't register or come exactly opposite each other, then you think a plain neck rivet would be the superior?

A. Yes, sir.

Q. I will ask you to examine the two rivets that have been filed in evidence, and ask you to state whether or not they are plain neck or swell neck rivets?

A. They appear to me to be plain neck rivets.

Q. Now I call your attention to Exhibit 6-A, and particularly the two rivets at the right, concerning which you have previously testified that the rivet did not pass through the holes at right angles, but that there was a slanting, due to the fact that the holes didn't, to use your term, register; and I will ask you to look at the riveted side of those two rivets, and particularly the second rivet from the left-hand side, and ask you if you observe at this time any defect or imperfection in the condition of the riveted head and the rivet, in connection with the hole?

A. These heads are practically corroded away, and some corrosion has taken place down in the cracks.

Q. Now then, in addition to the fact that the holes were not in register, there has, in your judgment, been a substantial loss of efficiency by reason of rust; is that right?

A. Well I would say that they still had a tremendous amount of binding power, in the rivets, but that some efficiency had been lost by the loss of a portion of the head; but exactly what, at the time, I don't know.

Q. Well at any rate, you testify that there is from some cause a loss of efficiency in the riveted head side of that rivet, is that correct?—The interpretation of your last answer?

A. What I mean to say is, it is not as strong as it would have been with the head.

Q. Now did I understand you to say that there appeared to have been a corroding of the head,—of the riveted head, I will put it?

A. That looks to me like corrosion, that causes that. I couldn't say what it was.

Q. Now Mr. Gibbs, I don't want my question to appear in a vein of sarcasm, but it may sound that way when I call your attention to a point that I would like to have you clear up. My understanding was, from your

testimony when first on the stand, that you stated that a film of rust constitutes a protective film of metal.

A. That, under certain conditions.

Q. Well then, you did not intend that statement to apply with any generality; it would be in particular conditions, is that right?

A. Oh, yes. I said that a film of rust that was protected by an air tight case, was—such as oil.

Q. Then do I understand you now to say that normally, where a rivet as in Exhibit 6-A, the head and—the snap-head and the riveted head are both open to atmospheric action, that in such case would a rust form and constitute a protective film?

A. I would think that the rust is subject to moisture, all of which is present in the atmosphere, that it is of no great advantage; but if the rust is covered as with an oil, that that constitutes something to fill the voids with rust, it constitutes a splendid form of protection. In other words the oxide,—the rust will resist further rust, but there must be something to prevent moisture, laden with oxygen, crawling in it by capillary attraction, in the void. The void must be filled.

Q. In other words as I understand it, rust might be used as a pigment, combined with oil or some other substance which would form a protective film, excluding atmospheric action, and in such case, such a film would be a protection?

A. Would block the capillary attraction of a void.

Q. But if a rust film forms on the outside of a ferrous object and continued to be open to atmospheric action, that rust film would not constitute a protection, would it?

A. It may not; on the other hand it may form in such a compact state that there are no voids.

Q. Well generally speaking, isn't it true, Mr. Gibbs, that where a ferrous object is open to atmospheric contact which induces the commencement of the formation

of rust, and it continues subject to the same conditions which induced the formation of the first form of rust, that the rust will continue to form indefinitely? Isn't that, generally speaking, true?

A. It is true in some cases. I know of cannon that have rusted, in the Fort at St. Augustine, Florida, when I was a little child, and they are in the same condition now, with no increase of rust, three or four hundred years old.

Q. The rivet head on this rivet in Exhibit 6-A, the second rivet from the left particularly, that riveted head has practically rusted away, hasn't it?

A. A good part of it has gone.

Q. Well is it, from your observation and in your opinion, a fair assumption, either that the head never was properly riveted, and never was a proper riveted head there, or that it has rusted away? Is one of those two assumptions a fair assumption?

A. In order to answer that question I must know whether you mean, on this tank.

Q. I am speaking of the conditions as you see it there on Exhibit 6-A.

A. In the making of this tank?

Q. For the use to which it was put.

A. Why I think that is tight, for the holding of gasoline in that tank.

Q. Do I understand you to say that you consider that second rivet from the left in Exhibit 6-A, in good, satisfactory condition?

A. For the purpose—that it was sufficient for the purpose for which it was intended.

Q. Are you able to tell from examination of that, or to express an opinion whether or not there was ever a complete riveted head there, or whether the head has been destroyed or taken away in part by corrosive action?

A. I think that the head was there, that it was under considerable tension. I think that when corrosion came

in there and got to working on it during the years, that it was stuck in the mud, the salt, I think it made a crevice in there, and its own tension snapped the head off and it dropped out of the hole. These are pure surmises.

Q. All right, sir. Now then—

A. Excuse me; the period I refer to is the period that the boat was sunk.

Q. I want you to tell us a little bit more about the actual experience upon which you have predicated certain of your answers. You were, as I understand it, are the executive and directing head of your business, is that correct?

A. Yes.

Q. And I am wondering if in the early inception, or at the commencement of this business, while it was small, you engaged in manual construction work or operations yourself?

A. You mean, whether I drove rivets?

Q. Yes, or, put on planking, or what not; did you ever do that?

A. Yes, I have driven rivets, I have pulled bolts. The institution I graduated from, I served in all branches of the trade; foundry, woodworking, and so forth; and since that time I have, my business being a small business, I have a total of as high as some thirteen or fourteen million dollars only in its existence; but I have had to know in detail a great deal of the quality of the workmen that were employed; and I have had to examine designs, and watch work particularly in connection with the building of tanks; because practically all the work we did for the government, it had the most rigid tests on tanks.

Q. I still have to ask this: now then what I want you to tell me is this; how much time have you actually spent in the actual month operations, by the use of your

own hands, of putting in rivets in steel tanks, or connecting steel plates?

A. Very little of my time has been spent in the muscle work of driving rivets.

Q. I assumed that was true, but could you tell me as best you can, how many hours or days have you ever spent, if any, in actually, by your own muscular effort, putting in or assisting in the installation of rivets?

A. Well I have bucked some rivets; I have stopped men making rivets,—doing riveting work, and shown them how to do it. I have jerked rivets out to show them why they had to buck the rivets continuously, and as they hesitated one minute, that the heads snapped back and they had an imperfect job. I have directed workmen over a period of years, and drilled them in the theory of the work, in order that they understood what they were doing; passed on to them that knowledge that I have accumulated in my lifetime as an engineer,—mechanical engineer.

Q. I understand that you think, and so far as I know you may actually know, all about riveting. What I am trying to find out is the basis for what you believe to be your knowledge, and I am starting in with a question now, and the question I asked you was not how much you know or think you know about the process,—and I am not criticising your knowledge; but I am trying to develop, upon what you base that assumed knowledge. And the question I asked you was, how many hours or days do you think you have spent in the actual manual application of rivets?

A. Well if you will apply hours or days, if you mean by that the time I have spent in thinking about them, and working with them:

Q. Now Mr. Gibbs—

A. As I stated before, I have spent very little time with a hammer actually applying my muscle to the job.

Q. Now I am trying to find out, and I think the question is clear,—how many hours make up that 'very little', that you refer to?

A. Oh, it would be hard to say, but very few hours.

Q. Ten hours, twenty hours, thirty hours do you suppose?

A. Oh, not that much.

Q. Not that much. All right, now we have got somewhere. Now then have you ever spent a single minute caulking a riveted seam?

A. Oh, yes.

Q. All right, how many minutes, hours or days, would you say?

A. It would be, if I would take a caulking iron out of a man's hand, say, "Now watch me, this is what I am doing"; I imagine that I hit five blows, and it would take four seconds to hit those five blows. I would take I believe fifteen different bits of instruction for each minute, and that would be sixty times fifteen such bits of instruction, in order to make one hour. Usually when I am dissatisfied with what is going on, if the foreman can't show what I want shown, in such an event I might do that. There would be many other people watching as a rule. But that doesn't constitute many hours of time.

Q. It is a fair assumption that you spent no more hours in caulking than you have in riveting?

A. Quite true, sir.

Q. Then your knowledge of the processes of riveting and caulking is theoretical rather than practical, is that true?

A. By no means.

Q. How did you learn to know so much and become a competent instructor, without actually performing the operation yourself?

A. That is a question, isn't it, that I may answer?

Q. Yes, sir.

A. All right. I learned about rivets, first, in the first grade of the grammar school, and from then on into the engineering institute that I became a part of and graduated in. I learned about rivets in the chemical department, where I took not only a course in chemistry, but an extra course in analysis. I learned about rivets in the study of metallurgy. I learned about rivets in the study of physics. I learned about rivets in the drafting room. I learned about rivets from engineers in the Westinghouse Company. I learned about rivets in the shop of the Bessemer-Cooper Corporation. I learned about rivets in the study of the science called strength of materials, where I was taught to solve stresses of all kinds by the use of applied mathematics. I learned about rivets in the study of analytical mechanics, and further analysis of stresses. I learned about rivets as no man never having understood those subjects that I was required to learn, in order to become a graduate of the engineering institute that I attended. By actual application in the manufacturing business, of tanks, such as we built in some quantities,—large tanks, small tanks, gasoline tanks, tanks for gas producers; of heavy plate and thin plate. I learned about rivets in knowing that in order to solve a problem you must know all facts connected with the problem, and must solve each problem based on its merits. I learned about rivets by observation of failures, due to the improper use of rivets. I learned about rivets by discussing their use, their kinds, and in various different positions,—boilers, et cetera.

Q. Now then in the course of all this extended study, did you ever learn that it was extremely—or were you ever told that it was extremely bad practice to let rivets go through at an angle in—through a drifted hole as we have in Exhibit 6-A? Did anyone ever tell you that that was just about the worst practice you could have in making tanks?

Mr. Underwood:

I object to the question.

A. No one ever told me that that was the worst practice that you would ever have. In making tanks, I was introduced to the drift pin and given a head to fasten to a tank, and told that the process of bringing those holes,—averaging up to get them as near registering as could be.

Q. Did anyone ever tell you it was bad practice,—whether the worst practice or not, that it was very bad practice to have holes brought into line by a drift pin, and a rivet passed through those two holes at an angle? Did anyone ever tell you it was bad practice?

Mr. Underwood:

I object to the question unless the type of construction involved is included in the question.

Mr. Botts:

I am not including anything more in that question, and I am requiring an answer to it.

A. I have been told that that was very bad practice in a high pressure steam boiler, but standard practice in the manufacturing of a tank of this type.

Q. Then you consider that practice as good practice, in the construction of a gasoline tank, do you?

A. I consider that practice—

Q. Answer the question yes or no and then explain if you wish.

Mr. Underwood:

There isn't any Court here to instruct this witness, and I object to Mr. Botts instructing the witness. If he can't answer the question yes or no—

Mr. Botts:

I will ask it a thousand times, until I get a yes or no answer, and if we stay here until next year, I will get a yes or no answer; I just put you on notice.

Mr. Underwood:

We will go across the hall and see the Judge, right this minute.

Mr. Botts:

I am not going anywhere; I am standing here until I get an answer to that question, right here.

Mr. Underwood:

Come on, we will go see the Judge.

Mr. Botts:

I am not going anywhere.

Mr. Anderson:

Tell the witness not to answer it unless he wants to answer it in his own way.

Mr. Underwood:

Put this in the record: Mr. Gibbs, for the present, at least until the Judge makes some contrary ruling, you don't need to answer that question yes or no, unless in your opinion you can give a fair answer to it yes or no.

A. Of course I can't give any yes or no answer to that question.

Mr. Botts:

Read the question, Mr. Reporter.

(Question read: "Did anyone ever tell you it was bad practice,—whether the worst practice or not, that it was very bad practice to have holes brought into line by a

drift pin, and a rivet passed through those two holes at an angle? Did anyone ever tell you it was bad practice?")

Mr. Botts:

If that question isn't susceptible of yes or no, I don't know it.

Q. Did anyone ever tell you that that practice that I have described, was bad practice?

A. You have just given half of the question.

Q. I ask you now, did anyone ever tell you that the practice which I have just described, was bad practice?

A. My reason for refusing to give—stating that I could not give a yes or no answer to that, is this: that it is good practice, it is standard practice, in some kinds of work, and the wrong practice in other classes of work. If that were not true, there wouldn't be such a thing as a drift pin that were known in business.

Q. Did anyone ever tell you that in the construction of tanks for the retention and storage of gasoline, it was bad practice to line holes by the use of a drift pin, and put in rivets at an angle?

A. That question still cannot be answered by yes or no, unless you state—acquaint me with the design of the tanks; and state whether they are to be soldered, for instance, or that they are not to be soldered; also the number and spacing of the rivets; if you tell us rivets are so many, that half the tension is enough, if you tell me the rivets are so few, you need a cross section of riveting in order to make it, that is still another factor.

Mr. Botts:

Now Mr. Reporter will you read the question again. I will have the question read all afternoon without change until I get an answer; we will be here for the next week.

I promise you that. You can't dodge a yes or no answer that way, not with me.

(The last question above,—for convenience referred to at this point and in the following discussion before the Court, as the basic question,—was read by the reporter.)

A. I won't answer that question, because it is just a part of a question, unless you let me state—I will tell you when you can do it and when you can't, and what is good practice and what is bad, as I know it. But I am not going to tell you that certain—answer you yes or no, and have my answer misconstrued as a statement that I have never been properly instructed or trained in my profession.

Q. I have no objection, after you have answered the question one way or the other, for you to make any explanation that you want to. I ask you whether you have ever been told that it was good practice or bad practice; I didn't ask you whether it was your opinion; I asked you whether you had ever been told it was good practice or bad practice.

A. I have been told what was allowable work to use, in which the holes could be drifted together, and the class of work that you could do that with; and I have been told the class of work that you should not do that with; and I can now tell you which is which;

Mr. Botts:

The class of work I refer to is clearly shown in the question. Would you mind reading that question again?

(The basic question was re-read by the reporter.)

A. Am I required to say yes or no, to that question?

Mr. Underwood:

Not unless you can do so in fairness to your understanding of the facts.

A. Well I regard the question as incomplete. No yes or no answer would suffice to answer the question. I have been instructed on the general principles of riveting, and those principles apply in this case. I have been instructed in the manner which would let me state whether I think drifting of the holes in this particular job, was good practice. I can answer that question.

Mr. Botts:

Now would you mind reading the question to him?

Mr. Underwood:

I object to reading him that question, or the propounding of that question.

Mr. Botts:

I don't care whether you object or not.

Mr. Underwood:

Mr. Anderson, let's go in and see the Judge.

(Mr. Underwood and Mr. Anderson retired, and thereafter returned.)

Mr. Anderson:

I suggest we just adjourn, Mr. Commissioner.

Mr. Botts:

All right with me; I live here.

(Following discussion, informal recess was had. At 2:17 o'clock P. M., Mr. Botts, retiring, stated:)

Mr. Botts:

I will be back in about fifteen minutes.

(At 2:26 o'clock P. M. Mr. Botts re-entered the hearing room, and at 2:34 P. M. stated:)

Mr. Botts:

I am going down the street; I will be back by three o'clock, perhaps sooner.

(At 2:55 o'clock P. M., Mr. Botts returned.)

At 3:30 o'clock P. M., November 22nd, 1939, counsel and witnesses were received for hearing before the Court; and thereupon:

Mr. Underwood:

Judge, we have reached an impasse on a question on cross examination by Mr. Botts, one to which I objected, and which the witness has indicated that he cannot answer yes or no; and one which Mr. Botts stated he would put all afternoon, or a thousand times, until he gets an answer yes or no. Now I think that I have been very patient in the examination of these witnesses; the case has gone on very, very long; it covers a lot of ground, much more than once; and it is well-known that not only we but Mr. Matteson are anxious to get back. And I have raised this issue because I think it is a serious one. I have no question of Mr. Botts' good faith in his cross examination, but cross examination has been so extensive and about so many points that don't seem to me to have any vital bearing on the case, that I would like to get a ruling on this particular question, and some advice from the Court, to all of us, as to just how we are to proceed. To that end I would like to have the reporter read the last half dozen questions and answers, so there may be a decision on the point.

The Court:

~~Is that your idea?~~

Mr. Botts:

I disagree, to this extent. The witness did not indicate that he couldn't answer that question, until that situation was suggested by Mr. Underwood. And I think clearly, in view of the questions immediately preceding, that this question is capable of being answered by a direct answer, yes or no, and then with any explanation he may want to make. I concede that after the witness has given a categorical answer, yes, no, I don't know, I don't remember,—that he can go ahead and make an explanation. But I submit that this question is susceptible of that answer. There was no objection to it on the ground that the general subject matter is not competent; it is just a question of whether or not this question as put is susceptible of an answer categorical in character, either with or without a supplemental explanation. And I think, unless we have a considerable amount of the previous testimony read, that the applicability and propriety cannot be determined.

The Court:

Will you agree on some point to which you want to go back?

Mr. Botts:

I think the last dozen questions and answers, approximately.

The Court:

Suppose Mr. Bryant reads that far.

Mr. Botts:

Mr. Bryant, if you would go back to the point where Mr. Gibbs was questioned and gave that five minutes or

so answer, as to his experience, and how he acquired his knowledge of welding,—back to that point I think is sufficient, whether that is included within the half dozen questions or not.

Mr. Underwood:

If your Honor please, I think one further question presents itself, in the merit of this particular question; that is, whether Mr. Botts is to be permitted to take possession of this hearing to the extent that he has attempted to do, in saying that he will put this question a thousand times, or all afternoon, until he gets a yes or no answer. That is one of the things that I should like to have instruction upon.

Mr. Botts:

And right along the same line, is Mr. Underwood to be permitted to tell the witness on cross examination, not to answer a question, and then stop the hearing until it is? That is as long as it is broad. If the question is proper, I had a right to have it answered. I submit that the proper procedure would be for the witness to answer, and then if the question is not proper, the Court can take care of that, on the hearing. And I submit that that is the proper way to proceed before a Commissioner,—to let the questions go in and be answered, and then if the questions are not proper, the propriety can be tested. But Mr. Underwood took it on himself to tell the witness not to answer my question, and I won't submit to any such procedure. If I am wrong, I will let the Court say so; but I conceive that the question was proper; and for him to just simply say, "Mr. Witness, don't answer that question"—I am not going to have him interfering with my examination in that manner.

Mr. Anderson:

Let's have it read.

Mr. Underwood:

If your Honor please, I gave no such instructions to the witness, as I think you will understand from the testimony as it is read.

(The last testimony given before the Commissioner, was read, commencing with the question: "Then your knowledge of the processes of riveting and caulking is theoretical rather than practical, is that true?")

Mr. Botts:

If the Court please, I would like to state my position on that question.

The Court:

All right.

Mr. Botts:

I was testing the knowledge of the witness, and the source—

The Court:

Do you want this in the record,—this argument?

Mr. Botts:

I don't care whether it is or not.

The Court:

I have got to read it some time.

Mr. Botts:

All right, don't take it down, then.

(Discussion was had off the record.)

The Court:

Well it is unfortunate that the hearing has had to proceed this way, and we didn't have the benefit of either the Court or the Commissioner who could rule on evidence; and I realize these gentlemen are laboring under some disadvantage in conducting the hearing now. Here is the thought I have in mind; the witness is being examined, not with respect to the particular tanks in question, but is being examined generally.

Mr. Botts:

As to his expert knowledge; right; testing his knowledge.

The Court:

Now the unfortunate part about it is that the witness has stated that he was told so and so, in connection with his answer to your question as to what his experience and education were.

Mr. Botts:

And he predicted his expert knowledge on it.

The Court:

Just let me conclude my thought. Now when he says in answer to a cross question, that "I have been told so and so", that is not his experience. He might have said, "I have been told that so and so is good practice", but that isn't evidence. What he is told was good practice, if his evidence is favorable to the side producing Mr. Gibbs,—the Respondents', that isn't binding; because that witness who told him that is not before the Court to be examined; so I regard that as really surplusage. The question is, with all that he has been told, with all that he had learned, the education that he had gotten, what is his opinion about rivets. That's the question. So I don't

think that these matters.—his voluntary statement in answer to the question as to what he had been told, I don't think that is binding on either side. Because if you are going by what somebody tells you, that is hearsay evidence, in the first place; and in the second place that person is not subject to cross examination. So it isn't what he was told, it is "What experience you have had". So that being the primary consideration, and if that problem is settled, I think the whole thing unravels itself. When he says what is surplusage, and you are inquiring about what his education and training is, why then it is not a theoretical question. ~~So if he does not state properly~~ in the beginning, and his voluntary statement as to what he is told, is not binding, then it applies to this cross examination. If what he has been told is not binding one way, what he hasn't been told, or whether he has been told that such and such is bad practice,—is inapplicable. So I think your question is too broad, I might term it,—or it is inapplicable; it is immaterial, because it is directed to an examination which is not proper evidence.

Mr. Botts:

Now let me go back to the inception of this line of questioning. I asked him for his practical experience, and he said he hadn't done as much as thirty hours menial work of either kind. Then I—

Mr. Anderson:

Manual, not menial.

Mr. Botts:

Then I propound the interrogatory, I said, "Your knowledge of riveting and caulking is theoretical rather than practical?" and he denied that, and went on for about five minutes giving his experience, showing these other things from which he had derived his knowledge.

The Court:

Well, with all of that, if that is part of his experience, that is subject to cross examination, as to what experience he has had, what he has stated. You might ask him, "Have you stated so and so?" you might do that. But to ask him a question as to whether this is bad practice, which is based upon the hypothesis that what he has stated was good practice, then when your hypothesis falls, then your question falls.

Mr. Botts:

But the basis of his knowledge is based upon all these things that he says people have told him. Now then, if this question is not allowable, it seems to me that his whole answer back there should be stricken.

The Court:

You make a motion to strike. I say it is unfortunate to have no one there to rule on it; but I will have to rule on it subject to motion.

Mr. Botts:

When you are going through an examination like this, —I felt when the witness answered that question, that it wasn't responsive; but that is in there, and what can I do about it? I can't stop him.

The Court:

But I think you can make your observations at the conclusion of his answer, that you move to strike so and so, on certain grounds.

Mr. Botts:

When he does that, I don't know how the Court is going to rule. If the Court leaves that in, and I don't cross on it, then I am prejudiced by it; and the only practical way

is for me to go ahead and examine him on the basis of these things that are in the record, until the Court strikes them out. If I am not permitted to do that,—if all of his testimony, including that answer, is stricken out, why then I would have no objection. And if it is going to go out, I wouldn't have ever asked this question in that form, but for what he had already put in the record. Now when he puts it in the record, how can I protect myself? We can't keep running to the Court to pass on every question, whether or not I conceive that they are admissible. So I say, from a practical standpoint, that the only thing I can do is to go ahead on the predicate that the answers of the witness will be left in; then all of it that is stricken out, it just goes out of the record, and no harm done.

The Court:

I think I can cover that. I think the best way to do it from now on, is for no objections to be made to questions before they are answered, and then let the witness answer them, and after the answers are in, let any motion be made on the record.

Mr. Botts:

If they want it put down that way, and with reference to this particular question, I am willing to let it go in in that way.

The Court:

If the witness says he needs some other elements in the question, you may do it.

Mr. Botts:

If the observation had not been made by counsel, we wouldn't have been here; because I never have yet tried to ask a witness a question that would embarrass him.

(Discussion was had off the record.)

The Court:

I have understood the position, and the more we bring this out and argue it, the more we have to say here. I understand the position with regard to that. I have understood from the first, what you have objected to, with reference to counsel interposing an objection; and I think the proper way to do it is as I have indicated.—Are there any remarks of counsel on that indicated course?

Mr. Underwood:

I would like to be instructed on one point, and have the witness instructed. If there is anything improper in the form of my objections, in the colloquy that has been read to you, I would like to be told about it now. Referring to my experience, my objections were properly stated, and were not suggestive, although Mr. Botts seems to find something suggestive in them.

Mr. Botts:

I certainly do.

Mr. Underwood:

If there is anything improper in the form of my objections, I would appreciate being told about it now. The other point is this; the witness said that he was unable to answer the question yes or no. I would like the Court to instruct the witness as to what his rights are in that situation.

The Court:

All right, sir.

Mr. Botts:

I would be glad, when the Court instructs the witness, but I don't like to have counsel instructing the witness.

That's my point that I have been making all the time. I am not particularly concerned with this particular question. I have said all along that this particular question is more or less innocuous; it is the principle of having counsel interrupt me when I am trying to get in evidence that I want shown. So far as this particular question is concerned, when we go back out there, without the Court's ruling, I am going to withdraw that question and propound another. But I am interested in my rights, and not having counsel come in with indirect suggestions, as I conceive them to be, to the witness.

The Court:

Well it seems to me another unfortunate situation, that which has naturally come about; I think the course that I have outlined would be the proper course, which I announced in the beginning.

Mr. Botts:

I will withdraw that particular question now, so you won't have to rule on it; but I am going to ask some others.

The Court:

Generally speaking, I concede the position of both counsel; that, not knowing whether you are going to insist on objections or not, I can see that Mr. Underwood would naturally make an objection before the witness would answer the question; so I think he was within his rights in making a formal objection. Of course you gentlemen differ as to whether it was suggestive to the witness; but technically speaking, I think that, since there was no announced ruling as to how the examination should proceed, I think it would be very natural and proper for Mr. Underwood to make the objection. Now that covers that.

Mr. Botts:

As I understand it, in the future, the question will be answered and then the objection will follow that?

Mr. Underwood:

If your Honor please, do I understand that I am not allowed to object to a question before it is answered?

The Court:

I think if you incorporate your objection to the answer when it was made, it would be much better, Mr. Underwood.

Mr. Underwood:

I have never been put in that position before. My experience has been quite the reverse; that, unless I make my objection before the answer is given, I waive my rights. I have taken thousands of pages of testimony without the presence of any tribunal to rule on objections, and that has been the universal practice; and I will be flat-footed if I am not allowed to proceed in that way, which I think is the right way.

The Court:

That is an established rule, that the Court states that you may proceed that way. You are not waiving any rights if you incorporate your objection in the motion.

Mr. Underwood:

I think the Statute says, as I recall it, that testimony by deposition—which this is, shall be taken in the same manner as in open Court; that is my recollection of it. Of course if the question is propounded in open Court and the answer given before objection is made, I waive my rights to object; my only right is to strike out as not responsive. That is the situation.

The Court:

I think you can incorporate more in your motion to strike, than "Not responsive"; and that which you would present as an objection to the question itself.

Mr. Underwood:

Furthermore, I see no basis whatever, in the character of any objection that I have made, for such a ruling.

The Court:

Well my observation is more in the line of outline of the policy to allow this matter to go on without the Court. I know you want to get back to New York and get through with this case; and you want to prevent the examination from being so prolonged. I am trying to work out something that will meet the situation we have here.

Mr. Underwood:

The situation will be equally met if I am permitted to make my objections in a proper way. If I make improper suggestions, it is time enough to enjoin me from making my objections until after the answer has been given. But I have been guilty of making no improper objections; I haven't led this witness. In the first place, he is an intelligent expert, knows a lot more about it than I do. I think my objections, made in the colloquy that has been read to the Court just now, were scrupulously proper.

The Court:

Well as I recall the general policy that I was following, Mr. Underwood, it was that on cross examination of a witness offered as an expert, that the absence of any essential elements which the witnesses want to have in the question, should be suggested by them and not by counsel.

Mr. Underwood:

I didn't suggest the elements, your Honor, that might properly be included in the question.

The Court:

Did you suggest an absence of elements?

Mr. Underwood:

I suggested an absence of elements, yes; I didn't suggest what was absent. I have to give the ground of my objection.

The Court:

Well it is hard to look forward and cover every kind of an objection. I can conceive of objections that really properly would be made before the witness answered the question. But on this one phase of it, the thought as to the absence of some elements that should be incorporated, or should be in the mind of the witness, I believe that that ruling would cover this particular one question.

Mr. Botts:

Let me make this observation: I have a question, counsel does not want it answered. This witness is not only a friendly witness, but a particularly partisan witness, who has been sitting in here advising expertly. Now, a question that counsel does not want answered, and he rises and says, "Mr. Witness, you don't have to answer this question if there are elements in it that you don't understand, or if there are added features that you want". And the witness immediately is conscious that counsel does not want it answered in that form, and so he says, "I can't answer it in that form"; and there you have the indirect suggestion.

(Discussion was had off the record.)

(The fifth question, with the objection following, in the testimony and proceedings previously read by the Commissioner to the Court, were again read.)

The Court:

I think that objection comes within the general rule that I have endeavored to follow on cross examination, especially in the latter part of the hearing of this case. I remember that pointedly came to my mind, that that was a good rule to adopt, as being a correct principle of law and evidence to apply here. So I think that following that, our *objection*, was not in line with that which I had heretofore followed; and I think that hereafter that ruling should control. So if the objection is a matter of non-incorporation of elements which counsel think the witness ought to have in mind, if that arises on the cross examination of an expert, I think the witness should voluntarily state what he thinks is lacking in the question. Now generally speaking, I realize Mr. Underwood's position is well taken, and is a departure from his general method of taking depositions; so probably I had better not attempt to rule on something generally, because that is pretty difficult to do. Outside of this one situation, this character of situation we have here, if Mr. Underwood thinks that he ought to object and that he would be prejudiced in any way by relegating his grounds of objection to a motion, why then I will withdraw what I stated as the general rule to follow in regard to that.

Mr. Botts:

Let me ask if this would be a proper procedure to follow: in the case that they conceive a question to be objectionable, to simply say, "I object", and then let the answer come in, and then the ground of objection be put in afterwards, applicable, so that the witness won't have the benefit of the suggestions.

Mr. Anderson:

I would rather say, that the objection shan't be couched in terms as would put that in the mind of the witness; otherwise matters of law would be objected to as in any other case.

The Court:

Can you all agree on that?

Mr. Botts:

I can agree, if proper.

The Court:

Can you agree on that as a method?

Mr. Underwood:

I will follow your Honor's direction, of course.

The Court:

All right.. Now with regard to the second request of Mr. Underwood, with reference to instructions to the witness; Mr. Gibbs is the only witness here; if you arrive at any other witness, you can read these instructions to the witness. If in the examination, you, Mr. Gibbs, as an expert witness offered by Respondent, on cross examination,—if you think that any question is incapable of a yes or no answer because you think some other elements should be incorporated, why then you call those to counsel's attention and state that those facts should be, and ask that they be, incorporated in the question.

Mr. Botts:

May I suggest there, you said, "Mr. Gibbs". If we say, "You, Mr. Witness", it will apply to any witness.

The Court:

Yes—an expert witness.

Mr. Underwood:

Does that mean, your Honor, then, that counsel is not to insist upon a yes or no answer if he has to propound the question a thousand times.

The Court:

As to this question?

Mr. Underwood:

As to any question.

The Court:

Yes, that is my idea about that. If the witness in answer to a cross question, says "I think there ought to be some other elements incorporated in there", then those elements are sought to be injected by the examiner, and if the witness still continues to be of the opinion that he can't answer that yes or no, I rather think that the Court ought to judge as to the quality of his answer, and so forth, rather than for an insistence being made as to a yes or no answer.

Mr. Botts:

I thoroughly agree, if the suggestion comes from the witness we won't have any trouble along that line.

Mr. Gibbs:

May I ask the Judge a question?

The Court:

All right.

Mr. Gibbs:

Where I am examined by counsel, and where I am repeatedly told that what I said was something entirely different from what I said, question after question, where

an admission by myself means a statement in the record of something that isn't a fact; such as a statement that I said that I had not had more than a certain number of hours of practical experience in the business of riveting, when I actually said that I had practically put in all of my life in business connected with riveting, but that I had not actually driven rivets, with a hammer, for as much as thirty hours; or, where I had not used a drift pin, or done the manual work: where I made such statements, and where those statements are repeated to me as though I had said them in a way that I am supposed to admit them, merely mixing the word "manual" with "practical", which completely changes the sense and puts me down as a witness without training, and as practically a fraud: I ask you, sir, if I may not refuse to answer a question by the word, yes or no? A question which, taken in itself, alone, would allow the counsel to state that I have stated that an act would be improper, with a certain sized plate,—would be generally improper.

The Court:

I think I understand your position, Mr. Gibbs. The whole matter has to be decided from this principle, if it is to be recognized, and which if I were sitting there I would try to apply, and that is, there must not be any arguing with the witness on his examination. If counsel conceives that what you have answered is inconsistent with some others answers you have given, why I think the proper method is to ask you, "I understood you to say; now did you state in your other testimony, this:" and you can answer yes or no. If it is incorrectly stated in the question, whether you stated that, naturally your answer would be "No, I didn't state that". If you want to go along and state what you did state, and repeat your testimony, you can do that.

Mr. Botts:

No disposition on my part to trap the witness, or to prevent the witness from protecting himself. If I misquoted his previous statement, I certainly want him to tell me so.

The Court:

Well the Court I think is the one to judge as to whether there was any inconsistency. That is a matter of argument and conclusion, as to whether you think that any statement given by the witness at this time, is different from any that he has stated theretofore; not to argue with him, but to ask him the direct question, "Did I understand your testimony heretofore to be so and so?" Yes, or no. If yes, yes; if no, no. If the witness wants to go on and reiterate what he has stated theretofore, why that incumbers the record with another answer, but attracts it forcibly to the Court, at that time, what he did state. Following that, while I don't think there ought to be any argument with the witness, I think you could ask the question, "If you stated this at that time, and I conceive your present answer to be so and so, which is I think inconsistent with that,—I think that is inconsistent; I think that does not follow. Do you maintain, Mr. Witness, that that is consistent?" I think you can ask a question like that.—Does that cover it?

Mr. Gibbs:

Yes, sir. There are times when yes or no, or, I don't know—

Mr. Botts:

Don't cover.

Mr. Gibbs:

Do not cover.

Mr. Botts:

And if you think I am asking such a question, stop me and try to explain why, and I will try and make it so we can get along. If you don't understand the question, you try to make it plain, and I will try to clear it up, between you and me.

Mr. Gibbs:

When you ask me a question, if I ask you to give me the complete data about the hypothetical problem, before asking me to say yes or no, we will have no trouble; but if you insist on an answer, yes or no, knowing that you have left the important factor out of it, I can't give an answer.

Mr. Botts:

That's right, I wouldn't expect you to.

Mr. Gibbs:

That's the whole question.

Mr. Botts:

You tell me when I have done that, and I will fix it up. ♡

Mr. Matteson:

Your Honor, would this be a convenient time to discuss what we do next after taking this testimony?

The Court:

Yes, it would be, because I hope you gentlemen will get through with this, this week; and if you do, why you will have completed it and I won't be here, because I will be away until next Monday.

Mr. Botts:

We are still hoping to get away tonight; we have lost two hours over this.

The Court:

If you get through now, I think the record of course will be written up and submitted to me; and as I understand it, you are going to brief it and submit briefs, after the exchange of same; and as I recall the general understanding we have, there would be no oral argument, but I do have this faint idea, that it was suggested that if I wanted oral argument after the study of briefs, why then I would so indicate.

Mr. Botts:

I would like very much oral argument. I didn't understand we were not to have oral argument.

Mr. Matteson:

That suggestion has not been made in my presence.

Mr. Botts:

I would certainly like to have oral argument if possible.

The Court:

I always welcome oral argument.

Mr. Botts:

Unless the Court rules to the contrary, I certainly want oral argument.

Mr. Underwood:

I think the question was, as to the time and character of argument.

(Discussion was had off the record.)

(Review and discussion before the Court was concluded, and at 4:25 o'clock P. M., taking of testimony was resumed)

before the Commissioner; the witness GEORGE W. GIBBS resuming the stand upon continued cross examination.)

By Mr. Botts:

Q. Mr. Gibbs, in your opinion, where a tank is being constructed for the purpose of the retention, transportation or storage of gasoline, is it proper in the construction of that tank to bring the holes designed for the entry of the rivets, into line, by means of a drift pin, where the holes otherwise would not be in line; and to rivet the plates together, where the holes had been brought into line in that manner, and the rivet passes through the two plates at other than a right angle.

A. All of them, or just one of them?

Q. A single rivet.

A. Would you mind leaving the question of transportation,—referring to trucks or something of that kind, out? That is a very special case.

Q. All right, I will put it in this way; in the question I will ask you to consider only such retention, storage or transportation of gasoline as might be involved in such transportation as would occur in gasoline tanks of a vessel such as the Seminole.

A. Well on the assumption that the rivets were close enough, that there would be no objection to that, it would be quite adequate fastening.

Q. You think under the circumstances stated in the question, supplemented by your addenda—

A. Where it is close enough, that would be adequate.

Q. You think then that such would be good practice?

A. Yes, sir, standard practice.

Q. Now then in the process of caulking, will you tell me whether it is or is not necessary, by the use of the caulking tool or iron, and the force applied to it, to bend, drive or push the metal of one plate up against the metal of the other plate?

A. It would be good practice to do that, to caulk it.

Q. I don't think I asked you that question; will you read the question?

(The question was read by the reporter.)

A. It is not necessary; it is not essential to do it, if the tank can be made adequately strong without that.

Q. But I say, when it is caulked, the process of caulking involves the driving or pushing the metal over, of one plate over against the other, or the pushing of the metal of the two plates together, doesn't it?

A. Yes, sir, that is what caulking is.

Q. Now then in so doing, is it possible in your judgment to accomplish that result without leaving a mark of the caulking iron upon the metal?

A. Yes, sir.

Q. Now do I understand you correctly to say that it is possible to drive that metal over, and still leave no mark of the iron?

A. Yes, sir.

Q. Now then would you tell me how it is possible to do that, without leaving a mark of the iron?

A. It merely takes a neat workman. My sketch—

Q. Which exhibit? That is Exhibit 161, is it?

Mr. Anderson:

Yes.

Q. All right.

A. My exhibit, 161, I have sketched a plate that is caulked, that would show an extremely small trace of the caulking iron. If we had dressed this plate back, that could have been brought down vertical, no space whatever. I can show you a great many tanks where you cannot tell they have been caulked, but they have been; a very great number.

Q. Now in referring to your sketch, as I understood you, you stated that as illustrated by this sketch, this could be done with little trace of the caulking iron. I understood you to say that?

A. It could be done with little or no trace; it would probably be more tedious.

Q. Then your assertion is that it can be done and leave no trace?

A. Yes, sir.

Q. In this process of caulking as illustrated by your sketch, Exhibit 161, and explained verbally, you take a metal, and probably a steel caulking iron, and place that against the seam to be caulked, at the point where it is to be caulked, and then strike on the other end of it with a hammer; is that the process?

A. Not necessarily against the seam at all times. It winds up against the seam, but you spread the end of the plate at an area between the enveloping plate and the middle of the—or seam section of the enveloping plate.

Q. And the force of this caulking iron then, driving against the end of one plate, spreads the metal of it?

A. Yes, sir.

Q. And do I understand you to say that that metal can be struck with sufficient force to spread it?

A. Yes, sir.

Q. And without leaving the slightest mark of that caulking iron?

A. Yes, sir.

Q. The metal of the end where the caulking iron is applied, is to some extent, displaced or transferred in location, is it not?

A. Yes, sir.

Q. And you say that that can be done by the force of a blow applied to it, through the medium of a caulking iron, and leave no mark whatever?

A. Yes, sir. There may be many blows.

Q. And those blows push the metal from one place to another, and leave no mark of the iron there?

A. Yes, sir.

Q. Then your testimony is, if I understand you correctly, that a seam could be caulked its entire length and leave no mark of the caulking iron?

A. A smooth seam can be, yes, sir.

Q. You are familiar with a metal shear; I don't know whether I use the proper term or not, but it is a metal device that shears through iron?

A. Familiar with a great many forms of it; they are quite varied.

Q. Is the metal shear—is that the proper term? A shear, do they call it?

A. Yes, sir; a shear.

Q. Now then when metal is sheared, how is that—will you tell me how that is done with the metal shear?

A. Yes, sir. The shear is a knife, which is somewhat like the edge of a table,—of this desk. Another knife, like the edge of another table, comes down and just grazes it. As the plate projects over the bottom knife, the other knife comes down and puts a pressure on the plate. The plate gives way, between the two, under what is known as shear, and the plate falls. Most shears work straight this way, and continue the shearing, first one edge, and then they go to the other; one form of shear.

Q. Is that the usual form of shear that would be used for cutting metal such as is used for a tank of this kind?

A. Well that is the element of most shears. There are other kinds of shears.

Q. Now then does not this shear leave at least microscopic marks across the edge of the sheared metal—or the sheared edge of the metal, I would say?

A. Well you can cut a plate with no—it may be the microscope will show it, but the eye could never detect

it, if it was done well; and the way it is once started, it practically holds its alignment so it is very difficult to change it from a straight line, or such a line as is fixed. One plate—

Q. The metal that is being sheared is held in a clamp of some sort so it is held firmly, is it?

A. I don't think these are—that is a form of shear; there is a clamp that comes down like this, you can screw it as strongly or as firmly or as loosely as you like. The usual practice, it comes down to where it is fairly loose.

(Discussion was had off the record.)

The Witness:

You asked me to describe the shearing process?

Q. Yes, and I was merely suggesting that if you had in mind, in answering that question, to put it in a form so that the Court can understand the technical features of it, if you want to add anything I would be glad to have you do it, otherwise I am satisfied to leave it as it is. It is with you.

A. Would you mind telling me which shear it is you want me to describe?

Q. Well I would suggest that you describe such a type of metal shear as in your judgment would be customarily used to cut metal such as was used in the tanks of the Seminole; I think that might be well.

A. It is my opinion that the tank of the Seminole was built in a small shop. If they were built in a large shop, a plate would come down—a clamp would come down on the plate and it would be sheared with one stroke, straight, and it would be in a perfectly straight line—that is, each plate. Those dished pads were probably made by some concern specializing in making heads; they were either punched as discs, or cut on a rotary

shear. The rotary shear, the square plate or the piece of steel is put in a clamp, and there are two rollers, one rolling just by the other, set in motion, and the plate was whirled and that cut the heads out in the form of discs. These were put in presses and were pressed into the shape that we saw them in these tanks.

Q. I was going to ask, when would—in what stage would the holes be punched?

A. The holes would be punched in the heads after the discs were made—after the discs were pressed.

Q. In other words, after they were pressed into their shape—

A. They would be punched.

Q. Then they would be later punched?

A. Punched or drilled, but in this case I think, punched.

Q. Now then the side seams in these tanks, can you give us any ideas as to how those were cut or formed?

A. They would be cut in a large shop with a straight shear; in a small shop, with what is known as a punching shear, which is a very rapid working tool, which cuts it about anywhere from four to ten inches at a time. As the plate comes under the discs—

Q. The plate is fed into the machine and it cuts it in more than one stroke?

A. Yes, sir; that is, if it is a small shop machine. (Illustrating.)

Q. Now then in that sort of a cutting, isn't a rather rough edge left where it is cut?

A. That is not necessarily. The plate that hangs down, acts as a guide against the edge of the plate that remains stationary,—the edge of the knife that remains stationary.

Q. But wouldn't there, in looking at that edge where it had been cut, wouldn't there be evidence in places of the knife's edge in cutting through? Wouldn't there be marks?

A. With any kind of a proper shear that would never occur; it wouldn't occur—it would be unusual.

Q. Do I understand it that these tanks, such as were in the Seminole, that if the plates were cut in some such manner as you have indicated, that in your opinion these plates could have been caulked and no evidence whatever of the impact of the caulking iron left on the plates?

A. I think that would have been a possibility.

Q. Now then I believe you have testified that in your judgment all of the seams of the Seminole—I will say the vertical seams of the Seminole tanks were caulked both inside and out; is that correct?

A. Yes.

Q. Can you point out on any of the samples that we have here, which would be 156, 157, 159 and 160,—can you point out on those seams any place where you can say beyond any question of doubt, that a mark is there which was the mark of a caulking iron and could not be the mark of anything else? Can you find one such point?

A. I can't say that any caulking iron mark could not have been made by something else. I can say—

Q. Can you point out what you say is a caulking iron mark?

A. I will say, this first plate I pick up—

Mr. Underwood:

One fifty six.

Q. Yes, right; one fifty six. Now then, will you take my pencil and point on that plate to some place that there is a mark of a caulking iron? You say, the entire seam?

A. Yes.

Mr. Underwood:

Witness indicates the length of the lower edge of the upper piece of plate, viewed from the convex side.

Mr. Botts:

I think, if I understand what you mean, why I think that is correct.

Q. At any rate, the figures 4-A in red on Exhibit 156; are on the outside walls of that tank,—of that segment of tank; is that correct?

A. Yes, sir.

Q. Now the plate in which the riveted head shows from the outside, I will call the upper plate; and it overlaps on what I will call the lower plate, reading so that the figures 4 and "a" are upright. And the place where you say the caulking iron shows, as I understand it, is in the lower edge of the upper plate adjacent to where the plate comes closest to the lower plate; is that correct?

A. Yes, sir.

Q. Now the purpose of caulking as I understand it, is to close the metal of the two plates together, so that if by inadvertence the rivets have not pulled them completely together, the caulking will do so; is that right?

A. That is one of the purposes, the usual purpose.

Q. Now then in the case of the plate, 4-A.

Mr. Dyer:

Exhibit 156.

Q. I should say, 156; I call your attention to the fact that at the fourth full rivet from the right-hand side—from the left hand side, I can insert my knife point an appreciable distance under the plate; and in a number of other plates along there I can insert my knife point under the plate. Would you say that in the particular case of caulking, if it was caulked, that the caulking was effective to produce the desired results?

A. I cannot tell you, because this has gone under a damaging process since it was caulked; the weather and the very terrific fire; the evidence of tremendous heat.

Q. Well let's get that point of tremendous heat; just a minute. Referring to Exhibit 5-W, my understanding

from your testimony yesterday was that by this terrific heat, the major portion of the galvanizing had been burned or feathered or melted off of the inside of that plate; is that a correct recollection of your testimony?

A. My testimony related in general to an inspection of all of the tanks. Some of them were very much more damaged than others. I don't know which tank this was, but this shows evidence of some deterioration from the elements.

Q. Look at that memorandum, see if that—

A. That is tank Four, which I think is one of the best tanks that we had,—or that which suffered least from fire.

Q. And can you tell me what part of the tank that was cut from?

A. Yes, sir; this is a part that was cut, with very little heat.

Q. This is cut two and a half feet above the bottom, was it not?

A. Yes, sir.

Q. I call your attention to Exhibit 5-V; would you say that there was more or less applied to 5-V than there was to 5-W?

A. Oh yes, there was very much more heat applied to this plate, because you can see the galvanizing is not only crazed, warped, but destroyed,—melted away.

Q. Then in 5-V your testimony is 5-V was subjected to a very much more severe heat than 5-W?

A. Yes, sir.

Q. And that the galvanizing on 5-V has been practically destroyed?

A. Well it has been destroyed in quite a number of instances. There is still some on there.

Q. Still some on there, but not much?

A. Yes, sir.

Mr. Underwood:

Is that question about the exterior surface?

Mr. Botts:

Both.

A. This is tank Four.

(By Mr. Botts):

Q. I call your attention to Exhibit 160 and I will ask you to look on the inside of it, and ask you if the galvanizing is still on the inside of that tank,—of that segment of the tank, I should say?

A. Yes, sir; there is some galvanizing here.

Q. I will ask you whether or not there is more galvanizing, in your judgment, on 5-V, 5-W, or 160?

A. I would say that these two are about the same.

Mr. Underwood:

Indicating 5-W and 160.

Q. Is there any more galvanizing, in your judgment, on 5-W or on 160?

A. I don't think I could answer that, Mr. Botts.

Q. You wouldn't want to express an opinion on it?

A. No, sir; this has recently had some particular scale that has pulled off of it; looks extremely bright, but how thick that is I don't know; or whether the nature of this compound that seems to have protected it here, and been totally absent in protective effects over here.

Q. All right, that gets to the next question I was going to ask. About three or four inches above the seam, or to one side of the seam, on the inside, there appears to be a very substantial amount of the galvanizing left; isn't that true?

A. No; I don't know how thick that is. Whatever it is, it has only recently been exposed to the atmosphere.

due to cracking here. On this side it does not seem to be galvanized at all; black iron. It may be at that spot; most of that black is a stain, I think; I don't know what it is.

Q. What do you say, at the point you have scraped off, is that galvanizing left there?

A. It looks like the zinc, to me.

Q. Now then will you scrape down between the rivets and see if there is any galvanizing there. It is steel?

A. It is steel, but it doesn't show up like the rest of it. I am inclined to think that that is a very thin coat of galvanizing there; it is apparently pressing right against steel, when you try to cut it.

Q. I will ask you to take the surface of 5-X, and on what would be the inside,—on what would have been as I understand it, the inside of the bottom of the tank, and I will ask you to examine that surface for the remainder of galvanizing.

A. I think there is very little galvanizing there.

Q. In other words your opinion is that on 160 there is appreciably more galvanizing than there is on 5-X, is that right?

A. Possibly.

Q. Well, give me your opinion now. You have stated there was considerable on one and very little on the other. Is it your opinion that plate 160 has more galvanizing than 5-X?

A. I didn't state there was considerable; I said in my opinion there was an extremely well-knit, very thin coat of zinc on it.

Q. Now I am asking you if you will make a comparison, in your opinion—

A. I think there is more here than here, per square inch. Per square inch, I think there is more.

Q. Eliminating rusted portions near the seam, as I understand your testimony, there is more galvanizing on one sixty than there is on 5-X?

A. Yes, sir.

Q. 5-X came from the bottom of some one of the tanks, I don't know which tank.

A. I think that's Number Four.

Mr. Anderson:

That's right, that is the one that wasn't painted.

Q. Have you got which one came from the bottom of tank Two? Let's see, here. I will ask you to scrape the shell on 5-Z and tell me, is there more zinc on 5-Z per square inch than on 160,—more or less?

A. There is less on this, and this; less on 5-Z.

Q. There is less zinc per square inch on 5-Z than there is on 160?

A. Yes, sir.

Q. Now then 5-Z came from the extreme bottom of tank Number Two, didn't it?

A. Yes, sir; I don't know about that. It is so marked.

Q. And 160 came from in the middle of tank Two, did it not—from the middle of the side wall?

A. I don't know what tank it came from.

Q. Well you saw it cut this morning.

Mr. Matteson:

What number?

Mr. Botts:

One sixty; 2-A came from that tank outside.

Q. Then as I understood your testimony yesterday, you accounted for the absence of zinc on these plates by the very great heat to which they had been subjected; is that right?

A. I may have said that that had something to do with the absence of zinc, but there were other things that took the zinc off. Much of that zinc has been taken off—whatever the number of that is.

Q. What else besides heat took that zinc off, in your judgment?

A. In my judgment? Corrosion elements operating over a period of years.

Q. Then will you offer your explanation as to why the side wall of the tank, half-way up, on tank Two, has considerably more zinc on it than the bottom member of the same tank? Was it heat that caused the difference, or what? You name it.

A. I could study that problem, but I have no explanation for it.

Q. You have no explanation for it at this time?

A. The fact that it has apparently more zinc.

Q. Am I correct in my recollection that on yesterday you accounted for the absence of zinc on the side walls of these tanks, by fire, and in support of that theory you stated that you found molten zinc in the bottom of the tank?

A. Yes, that is true.

Q. All right, then is it true that on yesterday your substantial explanation of the absence of zinc on these tanks was predicated upon the heat which had been applied to them?

A. Yes.

Q. All right. Then assuming that your answer yesterday was correct, how do you explain—is there any explanation, as to less zinc on 5-X than on 2-A, other than the fact that 5-X was subjected to greater heat than 2-A—I mean 160?

A. One should know the complete history. It is entirely possible for instance that this tank, for a long period of years, had a liquid in it that was corrosive, and that the top of the tank did not have. There are many things that might have happened. The fact, however, that the zinc is not gone from that tank, we know definitely that one reason it isn't gone is because the heat

was not as intense as it was on the tank that is all mottled and burned off. It was probably not as intense on that as on the other tanks.

Q. Then the probabilities are that for some local reason, Exhibit 160 was subjected to less heat than the other tanks; is that right?

A. It may have been. Or it may have been that these plates were even made up, coming out of the mill supply house, had a different quality of zinc,—a different method of galvanizing. We often have stuff returned to us to do over, and in all galvanizing plants. I think we have the only galvanizing plant in the state.

Q. In your judgment, was plate 160 subjected to a very high degree of heat such as you have referred to, with reference to other portions of other tanks?

A. Where did this come from?

Q. This was the one that was cut out of that side, in the middle,—the one the picture was taken of.

A. I think it was subjected to a very high degree of heat.

Q. You think that was subjected to a very high degree of heat?

A. Yes, sir.

Q. And yet the galvanizing was not taken off?

A. I don't see that the point at which every bit of the galvanizing is taken off, is necessarily so very much greater than that at which it does not melt. The melting point,—which is illustrated in—

Q. All right, is there more galvanizing on 5-W or on 160, referring to the inside walls?

A. They seem to be pretty much the same.

Q. You think they are about the same?

A. They look like.

Q. Would you say there was any appreciable difference between the two?

A. Not a very great deal.

Q. Well is there any, in your judgment?

A. As an indication of heat?

Q. No; I am asking you now for the quantity of galvanizing that is left.

A. I think that this plate, the middle plate, had quite as much.

Q. 160 has as much or more?

A. That's right.

Q. Probably if there is any difference, there is more on 160, isn't that true?

A. Yes.

Q. And yet 5-W came from towards the bottom of the tank?

A. Of a different tank.

Q. Of a different tank, yes; and 5-X came from the bottom of the same tank, and there is less galvanizing on that?

A. Yes, sir.

Q. Then is it true, from your observation, that towards the bottom of the tanks, irrespective of an assumed less heat being applied there, how do you explain that more galvanizing is absent?

A. It is a very simple explanation; that that there is every degree of galvanizing in the world; hot pressed; the hot system, which all of these are; the hot dip system; and the amount of galvanizing varies tremendously. You could put four ounces to the square foot, where you would probably run up to sixteen ounces to the square foot. The amount of galvanizing on this plate would have to be known before you could—

Q. Take Exhibit 5-X and look at the segment of the side wall of 5-X, and tell me how the galvanizing stands up there, if there is any?

A. There may be none left there.

Q. You are aware that in tank Two the side walls were made of two segments, aren't you,—riveted together?

A. Two plates.

Q. Two plates?

A. I think all of the tanks were made that way.

Q. Then the side wall segment of 5-X must have come from one or the other plate of which a segment appears in Exhibit 160, is that true?

A. Do you mean, these are from the same tank?

Q. Umh hmh.

Mr. Underwood:

That is Four, Mr. Botts, and this is Number Two.

Mr. Botts:

A minute ago they told me 5-X was from tank—all right.

Q. We will take 5-Z, then, they tell me now; I will ask you to examine the side wall segment in 5-Z for galvanizing, if you don't mind. The side wall there of 5-Z, examine it, if you don't mind, for galvanizing. Is there more or less galvanizing on the side wall segment of 5-Z or the segments of 160?

A. There is less on this lower section.

Q. There is less on this lower section. Now you will concede that this lower section must be cut from the same piece of steel that either one or the other of these segments in 160 were?

A. Yes, sir; I think so.

Q. And yet the lower section has less galvanizing on it than the upper section?

A. Yes, sir.

Q. Notwithstanding the fact you say the upper section was subjected to terrific heat?

A. Quite true.

Q. How do you explain that?

A. Because the one that has taken this off—

Q. You refer to the side wall of 5-Z?

A. That is right, is perhaps one agent or cause; other than heat.

Q. Will you please explain what theory you have as to what agent that was?

A. That might have been some corrosive elements that would tend to absorb the zinc.

Q. Then you propound the theory now with reference to that, that there was some corrosive force at work on the bottom of these tanks that did not operate high on the wall, is that it?

A. No.

Q. Then what was the corrosive force that took the galvanizing off the bottom portion of tank Number Two?

A. The time they were laid up, they might have been left empty; there was probably some moisture down in there, I think the water that would be left in there; and as the air would come in and out, it might have first worked on the full water up to here, up to the crown of the tank, and then as it evaporated it dropped lower and lower and gave what we call wind and water; and we might have had the forces that would have worked on this section of the tank. Eventually it might have all dried out. It might have been during the many years that that boat was laid up.

Q. Now I will ask you to take this segment, 160, and, eliminating the heat that was applied to the edges in burning it out, I will ask you to point out to me any evidence, if you can, that extreme heat was applied to that plate, or that portion of the plate.

A. Those rivets appear to me as rivets that have been in a very hot fire, and then left to the elements.

Q. Why?

A. The appearance is similar to other matters that have been through fire, that I have detected.

Q. In what respect?

A. In roughness, and in the general appearance.

Q. And why would not that roughness in general appearance apply equally to the inside wall of the plate?

A. This is the inside wall of the plate.

Q. All right, you referred to the rivets, with the evidence of fire; as I understood it, it was that the rivets had this roughness. Now wouldn't that extreme heat have been applied to the side wall adjacent to the rivet, as well as to the rivet?

A. I think there is a lot of evidence that there was heat applied there, because this galvanized plate was probably just prior to the fire,—is now covered with some compound which probably was the result of heat.

Q. Now you are propounding a theory that the scale on the inside of this is the result of heat?

A. Yes, sir.

Q. As an expert, if you propound that theory you must know the basis of some theory that would produce that scale as the result of heat. Will you tell us what that is?

A. I have not been proposed as a chemical expert. I have seen hundreds of fires where tanks that were galvanized and tanks that were examined have looked like one great white snow storm, and the same type of thing that you see there.

Q. Then you don't know in that case whether it was caused by heat or not, do you,—in this case?

A. It has the appearance of similar bits of metal that I have seen exposed to very intense heat.

Q. Now you are talking about the scale that was produced by heat. I want you to tell me why you think it was produced by heat?

A. I would not suggest any specific chemical reaction.

Q. Then your hypothesis in that respect was a mere guess, was it?

A. I don't think it was a mere guess.

Q. Well if you can't give the reason,—I want you to try to give me a reason based upon your expert knowl-

edge as to why heat would cause that,—or, admit that it was a guess. I would like you to do one or the other, if you can.

A. I stated that that is similar to many other metal tanks that I have seen exposed to very hot fires, and therefore makes me believe that that is the result of heat.

Q. And you think that this scale on the inside, then, is a deposit as the result of heat, and not from other causes?

A. Yes.

Q. Now that being true, I call your attention to Exhibit 5:

Mr. Botts:

Mr. Underwood, those are your letters; what is that,—5 what?

Mr. Underwood:

5-Y.

Q. 5-Y; and I will ask you if there isn't a similar scale on the side walls of 5-Y; having in mind the fact that the testimony is that that was cleaned with a metal brush?

A. That seems to me to be quite different.

Q. You say that that greyish brown scale on 5-Y is different in kind from the scale on 160; having in mind the fact that 5-Y had been cleaned with a wire brush, you say those are different?

A. Well you would have to clean this with a wire brush, then I could tell you. I just can't guess at it.

Q. You say now that they are different, do you?

A. They appear to me to be different, from what I can see.

Q. Now I call your attention to 4-B and I will ask you if there is a substantial difference between the scale

or covering, whatever you call it, on Exhibit 157, and on 160?

A. This that you see here is undoubtedly the mud of the river.

Mr. Underwood:

Indicating Exhibit 157.

Q. And you think there is a substantial difference between 157 and 160?

A. In these two?

Q. Yes.

A. Yes, sir; this seems to be mostly mud.

Mr. Underwood:

Indicating 157.

Q. Now you saw the two segments cut this morning, and you are aware, are you not, that one five seven was cut quite as high if not higher up on tank Number One than—on tank Number Four, than 160 was on tank Two, aren't you?

A. I don't know how high this came up.

Q. Well you saw it cut?

A. No, I didn't.

Q. You mean to say you weren't there when that was cut?

A. I was there, all over the place.

Q. You didn't see them when they were cutting that segment out?

A. Not to identify this plate. I would be willing to take your word for it, though, if you tell me where it came from.

Q. Now I call your attention to segment 4-A, Exhibit 156. Is there the same evidence of the same character of scale on 156 and 160?

A. That's different.

Q. It's different?

A. Yes.

Q. Then you say that segment 156 was not subjected to the heat to which segment 160 was subjected; is that right?

A. Possibly. This could go through a pretty terrific fire and still have—come out with that kind of a scale, I think; but those are matters, Mr. Botts, for a chemist,—for chemical analysis.

Q. The point I am trying to develop is, do you know that the scale on the inside of 160 was caused by fire, and the scale on 156 was not caused by fire; or do you know anything about it?

A. I merely stated I have seen metal tanks that have gone through fires and have come out looking similar to that.

Q. And you don't know whether the scale on the inside was caused by the fire, or what, do you?

A. No more than to tell you I have seen tanks come out with that kind of scale, that had been in intense heat.

Q. Do you know, Mr. Gibbs, that the scale on 160, or any other tank that you have seen, was caused by fire?

A. I do know that in other tanks it was, because they were perfectly bright before the fire, and were white after the fire.

Q. White; but this isn't white, is it?

A. Well, greyish.

Q. Now then do you know that the scale on 160 was caused by fire?

Mr. Underwood:

May I interpose an objection, on the ground it is repetitious.

Q. You may answer the question.

A. I merely state that in my opinion it was caused by fire.

Q. But you don't know, and you are not a chemist, don't know it from a chemical standpoint, do you? You are not a chemist are you? Don't pose as an expert chemist?

A. No.

Q. Then from a chemical standpoint you don't know whether that could be or was caused by fire?

A. From a chemical standpoint, no analysis has been made to make any proof.

Q. And from a chemical standpoint you don't know that that scale was caused by heat, do you?

A. It is my opinion it was, based on my observation of other tanks exposed to heat; galvanized tanks exposed to heat.

Q. Mr. Gibbs, I don't think you have answered the question. Would you read the question to him and see if that is—if he feels that he has answered that particular question?

(Preceding testimony was read, including the question, "And from a chemical standpoint you don't know that that scale was caused by heat, do you"?)

A. No.

Q. Then your hypothesis in that connection was not based upon any scientific knowledge, was it?

A. Why it was based on scientific knowledge.

Q. As a chemist?

A. No.

Q. As a metallurgist?

A. As one who has studied metallurgy, but not as a metallurgy expert; not as an expert in metallurgy.

Q. You don't pose as an expert in metallurgy, do you?

A. No, but I do pose as having a general knowledge of metallurgy; I have studied it.

Q. Then from your general knowledge of metallurgy, do you predicate your assumption that this scale was caused by heat,—on your knowledge of metallurgy?

A. Yes.

Q. And what theory of metallurgy do you refer to?

A. The theory that in a conflagration of this kind, certain elements under intense heat form certain scales.

Q. All right. Now then, do you have any knowledge as a metallurgist that heat applied to a galvanized surface will cause the character of scale that we have here? As a metallurgist; do you have any knowledge of any such theory?

A. Oh, I have a general knowledge. I have seen many salts formed from zinc, with the by-acids,—as a metallurgist; which have the same color as those.

Q. Is this, in your opinion as a metallurgist—is this a salt that appears as a result of heat?

A. I have no opinion as a metallurgist; but my knowledge of metallurgy leads me to believe that that is a scale that is caused by the action of heat and other elements.

Q. Well then as a metallurgist you are not prepared to state by what reaction that heat was caused, are you?

A. Not without consulting a chemist or attempting to analyze that myself.

Q. And as a chemist you can't propound the theory on which that scale would arise, can you?

A. With such knowledge as a mechanical engineer has of chemistry, causes me to feel that that scale which has formed on other materials, could form there.

Q. Now from your knowledge as a mechanical engineer, do you refer to your knowledge of chemistry?

A. I said, such chemical knowledge as a mechanical engineer has.

Q. All right. Now what is the chemical knowledge to which you refer in connection with that scale?

A. That which I have already told you; that zinc, for instance, there are certain salts that have—

Q. What salts; don't say, certain salts.

A. I don't remember; I am a mechanical engineer. But I do remember that there are certain salts.

Q. I am trying to find out whether you are testifying as an expert who knows the chemical reaction, or whether you are risking a guess that this might be, that any unexpert person might make?

A. I am not risking any guess; I am giving you the benefit of an opinion based on my experience.

Q. All right. Then your opinion is not as a chemist, nor as a metallurgist, but on experience?

A. As a mechanical engineer.

Q. Then your answer is not predicated in any way upon your expert engineering education, but upon what you have seen from a practical standpoint, that a high school student might have observed; is that right?

A. Not at all.

Q. I want you to point out to me wherein your expert knowledge tells you that, if all you know is that you have seen it on other tanks?

A. I cannot add to the information that I have given you on that subject.

Q. Well now then, so far as I recall, you didn't give me any opinion except a guess. Now will you tell me what information you have given me on that subject? Just repeat what information you have given me that was not a pure guess.

A. I have stated that as a mechanical engineer I have come in contact with fires, where tanks covered with zinc have been subjected to great heat; that I have seen colors which are quite similar to those; that those colors are regarded by me as normal, because in my studies

I have learned that certain reagents bring about certain colors, with zinc. What those reagents are, I do not remember; but I, being a mechanical engineer, having gone through those courses, I can state that scientifically they can be accounted for.

Q. Now you mean to propound the theory that you know as an expert, by reason of your study of metallurgy and chemistry, that fire applied to a zinc—a galvanized plate, will produce a scale such as we have on plate 160?

A. I did not say that

Q. Well then wherein does your expert knowledge give you any advantage over what you might have observed had you not had that experience? If you can't give the reaction, how do you know that it was caused by a reaction?

A. Because I have seen the reaction repeatedly; but because I do not remember the exact reagent, does not mean that I cannot swear that such a thing—a reaction, has not been caused on that plate.

Q. Then to get down to simple words, you don't know what caused it, do you?

A. I do know.

Q. Well then, tell us.

A. I have told you, that in my opinion that was caused by great heat; and I have given you my reasons. I can give you no more.

Q. All right; I thought so.

(Following discussion as to further procedure, at 5:58 o'clock P. M., recessed until 6:15 P. M. of the same day, to-wit, November 22nd, 1939.)

Evening Session.

November 22nd, 1939, 6:28 o'clock p. m.

Hearing was reconvened pursuant to recess, and the witness GEORGE W. GIBBS resumed the stand and further testified as follows upon continued cross examination.

By Mr. Botts:

Q. Mr. Gibbs, referring to Exhibit 159, which is the exhibit, the inside edge of the plate, you testified was in your opinion caulked its entire length; am I right?

A. I think that one, the record will have to show; I can't say now.

Q. That is true?

A. That is one; yes, sir.

Q. In caulking that plate, the caulking iron such as you have described, would be placed against the edge of the plate, and tapped with a hammer, and moved to successive locations; is that right?

A. It would be an iron with a greater angle edge than the one on Exhibit 162.

Q. Well irrespective of the size or character of the caulking iron, the end of the caulking iron would be placed against the edge of the plate?

A. Yes, sir.

Q. And struck with a hammer, and moved along to successive locations, so it would cover the entire length of the plate?

A. Yes, sir; that is right.

Q. Now will you please explain whether or not in your opinion the outside seam of Exhibit 160, as shown, was caulked?

A. Yes, sir, with an iron quite similar to the one that the plate you have just exhibited to me was caulked with.

Q. Now then the edge of the seam was not in that instance closed down, was it?

A. Yes, sir; it was.

Q. Now can you see the mark of the caulking iron along the edge of the outside seam in Exhibit 160?

A. This is 160?

Q. Yes.

A. The outside one.

Q. Can you see the marks of the caulking iron along that seam?

A. Yes, sir; just as in the last one.

Q. And it was moved along successively from end to end?

A. Yes, sir.

Q. When it got to the offset at the edge—

A. It draws right in and tended to mash a place from here to here; and this thing is cocked up, and confirms my opinion.

Q. Then that iron was driven along.

A. It was driven along to the place which has the appearance of a slip with the shear, and lifted that particular place up.

Q. You observe, do you not that the upper plate is lifted away from the lower plate?

A. Yes, sir.

Q. If that plate was caulked, how do you account for that condition?

A. Well I think where the end of the iron, it was down to the—the rivets held it down and that did bring the contact, and that the heat is the thing that has caused this condition now—the heat and the action of the elements.

Mr. Botts:

That is all.

By Mr. Matteson:

Q. Mr. Gibbs, you have heard of chipping of steel vessels, have you not?

A. Yes, sir.

Q. And that is done in preparation for painting, is it not?

A. Yes, sir.

Q. And the chipping is to take the rust off, is it not?

A. Yes, sir.

Q. Well why would that be necessary, if rust when covered by paint is a protective seal?

A. I don't claim that rust is a protective seal at all times. But it would be particularly necessary to take the rust off there, because the rust is subjected to moisture,—moisture of the sea.

Q. If it were covered with paint, it would not be so?

A. The rust? Well there would be the moisture inside; it may be that you could put a coat of oil on the—in fact that has been done, to some extent, with a certain kind of new oil that has come out; it is put into the rust. It hasn't been in use long enough for me to tell you the results.

Q. Will you tell me what that oil is?

A. It is made of a fish oil; where you paint right through the rust.

Q. What is the name of it?

A. I don't know, sir. A salesman came to us with it.

Q. Do you mean to tell us that that sort of paint is put on over rust?

A. I say, experiments are being made with it. There are very few experiments, Mr. Matteson; the man who is making an expensive ship, at a big cost of scaling and painting, in the actual handling of the ship,—the matter of using for protective coat in connection with oil, hasn't been in general practice.

Q. Then I gather that you agree that until quite recently, that this fish oil you speak of has come on the

market, that it has been the universal practice to chip and remove the rust from steel vessels before they are painted?

A. Yes, sir; that is true; I think it is due to the fact that the moisture is there, and the fact that rust is a very rough thing, and that the smoothness of the ship is in dollars and cents.

Q. Well if rust were smoothly covered over with paint, so that it made a protective seal, there would only be a limited quantity of moisture underneath, wouldn't there?

A. It might be done, but on a ship you couldn't depend on a protective area, because they are subject to scraping, the whole bottom will come up, a channel may touch the bottom. I don't think that that would be practical on a ship.

Q. Well it is just as customary to chip the interior part of a ship before painting, as it is the exterior, isn't it?

A. Yes, it is.

Q. And there is no danger of such contacts there?

A. No, there wouldn't be. I say it is not customary; whether it would be good or not. But it is not customary.

Q. It is not customary to what?

A. It is not customary to leave rust on a ship anywhere.

Q. And the reason it is taken off before painting is to prevent further corrosion, is it not?

A. Well yes, that is one of the methods of preventing it; the principal method in use.

Mr. Matteson:

That is all.

Re-Direct Examination.

By Mr. Underwood:

Q. Mr. Gibbs, you were asked about the effect of heat on boiler plate as compared to the effect of heat on the plates of these tanks. Do you have some further explanation you would like to make as to the difference, if any, between the two?

A. Yes, sir. Heat applied to a boiler is applied in a very special way, through the fire-box; sometimes protected with fire brick, or water-cooled furnaces, or one thing or another depending on the design of the boiler. Inside of the boiler there is water, which prevents the temperatures from ever reaching the boiler—that portion of the boiler that this would be made of—that would be made of this material, from reaching a temperature higher than the temperature of the water at the pressure to which it is heated.

Q. Have you ever seen a boiler that has been subjected to fire without water in it?

A. Yes, sir.

Q. Will you tell us whether or not that resembled these plates?

A. It is usually a wreck.

Q. Does it resemble in any way the remains of the Seminole's tanks?

A. Yes, sir; the plates would be warped and distorted, and if the heat were great enough the tops would fall out of it.

Q. The reason for that is what?

A. Due to the fact that the temperatures had been raised to a very high degree in a fire, and where—and due to the fact that this same boiler was designed to be subjected to temperatures no greater than the temperature of the water at the pressure in which it was designed to work. I do not refer, however, to certain sections of the fire-box or smokestack.

Q. Mr. Gibbs, I call your attention to the rivet heads on sections of the tanks, from the bottom of number two, and number three. Exhibits 5-Z and 6-A respectively. You observe that difference in the heads?

A. Yes, sir; I do.

Q. Can you express with reasonable certainty any opinion as to whether or not the heads of the rivets from number three tank were ever in the same condition as to size, as the heads of rivets in the other?

A. In number four tank?

Q. The one with Four on it; it is number three tank.

A. I think these were ones the same as these.

Q. You mean that the rivets—heads of the rivets in number three, were the ones the same as the other?

A. I think they popped off.

Q. Due to what?

A. Due to the heat, and some corrosion which has—but principally to the period when they were actually exposed to the—to some condition which caused the corrosion under the heads, or in the crevice of the head. I notice some of these rivets have been—this for instance showed fissures in here.

Q. Did you notice—

A. I think when they were cut down over here, the person who put them in, the rivets swelled, as it was, and the rivet was cut down over here, perhaps not a seal, and that the fissure—corrosion set in there and the tension of the rivet caused that head to pop off when the compression of the head was resisted by the tension at this point, pushing it away when that section was released.

Q. Did you observe any other indications—

A. Or reduced to a point where it could not hold.

Q. Did you observe any other indications on the tanks as to the comparative effect of fire, between number three tank, and the others?

A. There seemed to be a mark on all the tanks that would indicate very different treatment had been administered to the tanks by the elements; fire principally.

Q. Did you note the comparative height of the remaining solder on the side seams of the tanks?

A. It seemed to be about the same in all, and the presence of solder in a perfect condition would indicate that very low temperatures had always been present in the lower part of that tank.

Q. I just want to shorten this as much as I can, Mr. Gibbs. Did you notice the comparative height of the remaining solder on the side seams of the tanks, as between number three tank on the one hand, and the other tanks on the other hand?

A. It was about the same.

Q. Do you remember how high the solder went up?

A. I think about twenty inches.

Q. And what is your recollection as to how high it went on number three tank?

A. I think there was very—only traces of solder, as I recall.

Q. In the side seam?

A. Yes, sir.

Q. Well does that have any bearing on your answer as to the effect of the fire on the rivet heads of number three tank, and the temperature, as compared with the rivet heads on the other tanks?

A. Yes, I would understand from that, that number three tank had been subject to the same heat at the top as the other tanks had been subject to; and that had been the one tank that was not protected by whatever did hold the temperature down on the other three tanks, as evidenced by the solder, with a known melting point.

Q. You were asked something about the difference between plain necked rivets and rivets with taper necks. In your opinion, were rivets with plain necks, adequate for tanks of this type?—for such use?

A. I would have thought that a preferable rivet for this particular job, in my opinion.

Q. Several aspects of these tanks have been called to your attention; for example, instances where the rivets are said to be in holes that are not concentric, and other such things. Will you tell us, in your opinion, from all that you have seen of these tanks, including the cutting of the pieces out of them today, and your examination of the pieces, whether in your opinion they were reasonably adequate for the purpose, before the fire?

A. I should say they were entirely adequate and perfectly safe.

Mr. Underwood:

That is all.

Re-Cross Examination.

By Mr. Botts:

Q. There is one question that I forgot to ask. I dislike to get back to this scale with Mr. Gibbs, on 160. My understanding is from you that you propound the theory that the scale that appears on the inside of this Exhibit 160, was a scale caused by some chemical reaction due to the combination of the fire and the galvanized surface of that tank; is that correct?

A. Yes, sir.

Q. Now then in your judgment, the heat—I mean the scale, would not have occurred but for the heat; is that correct?

A. That is my opinion.

Q. And that the scale would not have occurred but for the galvanizing; is that correct?

A. Not entirely, although I think—I believe that that was the way it was done; that the zinc had a very—probably was the responsible agent.

Q. Then you definitely propound as your expert opinion, that this particular scale on those galvanized surfaces is the result of a combination of the existence of that galvanized surface, plus the adding of heat; is that right?

A. Yes, sir; not as a metallurgist, but as an engineer who has spent a great deal of time around machinery.

Q. Well that is the theory you propound; you don't pretend to know what the chemical reaction was that created it; is that right?

A. No, sir, I am only suspicious of it.

Q. I think you will concede that the same or greater heat was applied on the inside—that the same or greater heat was applied on the outside of that tank, that was applied on the inside, wouldn't you, at the same point?

A. I could not tell that, sir; because on the outside you had radiation coming to your aid, and on the inside you did not.

Q. Do you mean to say that at this point the inside of that tank was hotter than it was on the outside just opposite that?

A. It depends upon where the fire might have been at on this side of the tank.

Q. But this is the inside of the tank.

A. That is a factor handicapping the coolness of it, and that is a factor that is not subject—cannot be regulated.

Q. Do you assert that the inside wall of that tank might have been hotter than the outside immediately opposite to it?

A. The inside might have been hotter; yes, sir.

Q. You think that is possible?

A. Very possible. Heat could get there by conduction; it would go through the entire plate.

Q. Wouldn't the heat in this 3/16ths inch plate—wouldn't the difference in the temperature on one side of the 3/16ths plate and the exactly opposite point on the outside,—wouldn't the difference in temperature be impossible to gauge?

A. No.

Q. You think there could be a difference, an appreciable difference in that temperature, one side of the plate over the other?

A. Yes, sir; there could.

Q. In a plate 3/16ths inch thick?

A. Yes, sir.

Q. Now will you explain to us, if that heat was applied and that scale was caused by heat plus the galvanized surface, why there is none of that scale on the outside of that same plate?

A. Yes, sir; very gladly tell you. This opinion is based on my general knowledge as an engineer. There may have been all kinds of reaction to the enclosed tank, that wouldn't have existed on the outside of the tank. One of your principal reagents is oxygen, and the elements of the air, which might not have existed to the proper extent inside of the tank. Also there may have been gases inside of the tank that were not outside of the tank.

Q. Well then I was very careful to get you to propound your theory that it was caused by heat plus galvanized surface, and you gave nothing else. Now then when I call your attention to the fact that the same reaction didn't occur on the outside galvanizing of that same plate, is that the first time this added chemical reagent has occurred to you?

A. I have learned a great deal of chemistry from you, sir.

Q. You will do well if you learn chemistry from me, because I don't propose to know any.

A. But my general knowledge as a mechanical engineer shows me that one reaction would happen inside of a cauldron and another one outside; that the important factors in any reaction are the constituents of the mixture, or the reagents.

Q. Then you want to add now to the reagents which operated on the side of the tank, the gas that was inside of the tank?

A. No, Mr. Botts, I wish to state clearly that I am not a chemist, and that I only know that the answer to exactly what is on the inside of that, can only be gotten accurately, chemically, by a chemist; and that the sole statement that I have to make is that the—what exists inside, in my opinion, has little to do with what exists outside, as both of them had unknown treatments.

Q. Since the same scale was not produced on the outside of that tank, if it was produced in whole or in part as the result of heat and galvanizing, if that were the sole cause, then it would appear on the outside as well as the inside, wouldn't it?

A. I would not say that, because one very important element is oxygen in the air.

Q. Wait a minute.

Mr. Underwood:

I think he ought to be permitted to answer.

Q. Go ahead.

A. You may have a certain reaction in the absence of a catalytic agent, that would be entirely—just wouldn't happen. I would also like to state, Mr. Botts, we seem to have considerable trouble in understanding each other; that many chemical processes might have taken place in that tank, due to the condition that the tank was left in, plus the action of the elements since the fire; and certain chemicals that might have reached the inside or the outside of the tank, from either mud, salt water, lime, or even biological matter; it has even been suggested that the tank might have had some coral formation; I don't think that.

Q. Then do you pretend to offer any definite hypothesis explaining the scale on the inside of the galvanized surface, and not on the outside?

A. No chemical prediction, but merely a statement of fact; that the treatment was entirely different, in all likelihood, on the outside and the inside.

Q. Then am I to understand you to take the position that in order for this scale to be produced, mere heat, and galvanized surfaces, won't produce it, will it?

A. I don't say that, although I think those were the principal factors, in most of the scale that we see there. That is just a guess.

Q. Then do you propound the theory that heat plus galvanized surface, plus gasoline fumes, is necessary?

A. No.

Q. Well, would heat plus galvanized surface plus air—is that your theory?

A. I don't know what was there. I don't know what chemicals are released in the average fire. I merely state that I have seen metals discolored in that same manner, around in a great many fires, places exposed to heat; and I recognize it as the result of heat; and I don't know what the—

Q. The case you refer to, was that heat plus galvanized surface, plus what?—in the other cases?

A. In the other cases I have seen boats gutted with fire, and I have seen galvanized tanks of that color; and I have seen great ice factories which have galvanizing around them, destroyed, and these tanks of the same color—galvanized sheets.

Q. In those ice factory cases, was there any gasoline fumes present?

A. I couldn't say, sir.

Q. Now then as a matter of fact, Mr. Gibbs, isn't it true that this theory that you have propounded with reference to that scale, has no scientific basis of which you are aware, or which you can explain?

A. I would not say that, sir. I say that in my opinion it is based purely on science.

Q. Then would you mind reading, to refresh my memory, that last question?

(Preceding testimony was read by reporter.)

Q. I asked if it was based upon a scientific theory of which you were aware or which you could explain. Now then are you aware of any scientific theory upon which it is predicated?

A. I am only aware that zinc, that I have observed exposed to heat, has left that same color. Also aware that certain zinc—that when zinc is treated with certain reagents it has that same color. That is a scientific deduction. If I were a chemical expert I would refuse to say anything about the plate; I would take it out and tell you definitely what was in it. I am not that, but I am a mechanical engineer, and I have given you my opinion based on such observations as I have made in the past.

Q. Exactly. Then this is not a scientific theory of yours, of which you are aware, but a practical observation which you have made; isn't that true?

A. Mr. Botts, I think it is a scientific—it is an opinion based on pure science. I can tell you for instance the effects of electricity, yet I decidedly do not know what electricity is, and no other man does. However, it is based on a scientific training, that I am able to tell you much about electricity.

Q. Now then this scale on here, you say it is based upon a scientific theory of which you are aware; is that correct?

A. It is based on scientific knowledge that I have, that permits me to state that it is similar to other materials that have become that color after fires.

Q. All right; then this as I understand it, you wish to say that this is a scientific theory of which you are aware; is that right? You are aware of the scientific fact upon which you base that theory, is that correct?

A. Yes.

Q. All right, but you are unable to explain that scientific theory, is that correct?—the Why?

A. I doubt whether there is any chemist in the world that can give you the why of it. He could tell you that certain salts which certain reagents resulted in certain new chemical compounds, but he could only give you his guess, based on observations as to what happened. That is all I can give you. And he is a scientist, and as far as I have expressed an opinion, it is based on such science as my profession enables me to base an opinion on, in that manner.

Q. Well the theory that you propound is that there may be a reagent which may cause that reaction; is that it?

A. Yes, sir.

Q. But you don't know what it is?

A. That is right, sir.

Mr. Botts:

That is all.

By Mr. Matteson:

Q. Mr. Gibbs, these rivets that have been taken out of the tank number four, are not called swell-neck rivets, are they?

A. No, sir.

Q. Do you think they were driven hot or cold?

A. Oh, I think they were driven hot. I can't say about that.

Q. Now you are familiar—

(Preceding testimony was read by reporter.)

Q. You say you can't say definitely?

A. No, sir.

Q. Now you know what the American Bureau of Shipping is, of course?

A. Yes.

Q. And that is the American classification society that sets certain standards with respect to shipbuilding, is it not?

A. For certain ships; just as Lloyd's, if you want it built according to their specifications, you can have the builder build it.

Q. And that applies to repairs as well as building, doesn't it?

A. Only if you want the boat repaired in accordance with those specifications.

Q. The standards set by the American Bureau in that respect are reasonable standards, are they not?

Mr. Underwood:

I object to that on the ground it is too broad.

Q. Do you want to answer the question, Mr. Gibbs?

A. Yes, sir, I would just as soon answer the question. It depends entirely upon what the purpose of the specifications was.

Mr. Underwood:

Let me ask a question for my personal information. Have I gone beyond the boundaries of the Court's statement?

Mr. Matteson:

I guess there is no harm done.

Q. I mean, would you recognize that there were good reasons behind most of their rules—would you not?

A. I think so, sir.

Q. Now I refer to a rule in their publication, under Section 23, under the general head of Riveting and Caulking, which reads: Pan head rivets for use in water-tight work under engines are to be swelled in the neck so as

to fill the countersink due to punching.—Do you agree with that?

A. For certain tanks I think that is a very good idea.

Q. Well this seems to be general in its application with respect to water-tight work. Why do you agree with it generally, and not with respect to these tanks?

A. For the reason, Mr. Matteson, that these are peculiar tanks. They are considerably heavier than the tanks that would be required for the duty that they performed. And they have more rivets than would be required to resist the pressure; and whereas you might get a tank of uniform strength of considerably less weight than this tank, this tank, whether it complies with the American Bureau's Rules or not, is more than ample, in my opinion, for the purpose for which it was intended.

Q. Well the point, I take it, is that you—although this requirement appears in American Bureau's publication, with respect to water-tight work, you think it is unnecessary as far as the Seminole's tanks are concerned, with respect to gasoline tightness?

A. Now that is not my idea at all. I think that these tanks are entirely adequate for the service for which they were used. I can conceive of much finer tanks, but of no greater strength. I might even bring out the fact that when a boat is built, as a rule—a new boat, that it is designed to have the various parts of uniform strength and life; and in this particular instance, tanks with a life considerably longer than the life of the normal tank; were installed in the Seminole.

Q. Now you are also familiar in a general way with the rules and regulations that are put out by Lloyd's Register of Shipping in respect to the construction and repair of vessels, are you not?

A. Not particularly. It is seldom we have to refer to rules of Lloyd's.

Q. I mean Lloyd's is the English society that corresponds with our American Bureau, is it not?

A. I understand it is.

Q. And it sets standards in the same general way that the American Bureau does in this country?

A. I understand that it does.

Q. Now I notice that their rules with respect to riveting, under the head of 'Rules for construction of vessels intended to carry oil in bulk', with respect to riveting, say: 'Where any unfairness exists in the holes they are to be rimered, not drifted, and larger rivets used in the rimered holes.—Now you say that you disagree with that?

A. Absolutely not, Mr. Matteson. The building of a tanker is a very particular kind of work—piece of work; and the ship is a part of the tank, in most instances; and any great strain on the ship puts a strain on the tank, and that strain could cause a leak which would make the ship be extremely dangerous. And so tankers are the most expensive ships in the world, for their hulls, and you have to put the strongest type of construction in every single section; great bracing, for instance, that would not be necessary in a tank supported in a ship.

Q. Well a provision such as this relates to tightness rather than strength, does it not?

A. That relates to a boat design of interior strength.

Q. You don't think that this provision relates to tightness?

A. Oh I think that relates to tightness and strength; but it also must resist the strains of the ship, which are integral, in my opinion, with the tank. I wouldn't think that any rules there were applicable to this kind of a tank—cylindrical tank inside of a boat.

Q. You have given us various opinions here as to the efficiency of the Seminole's tanks. Now I gather that those opinions are personal with you, rather than based on any standards which are published, to which we could refer; is that right?

A. I merely—my opinions are based on the present conditions of the tanks at this time, with the history of the tanks before me.

Q. Well, there are no published sets of standards to which you could refer, supporting your opinions?

A. As to how long a tank of such a nature will last?

Q. As to the sufficiency of the type, and of rivets, and workmanship on the rivets, and particularly with respect to the use of a drift, and offset rivets, on tanks of this type.

A. There are untold treatises on tanks, their proper construction, and so forth.

Q. Well I don't know of any one that, with respect to gasoline or oil tanks, approves the use of offset holes through the use of reamer—I don't mean a reamer, I mean a drift pin, and the placing of the rivet in on a slant, as has been shown to have been the case on Exhibit 158.

A. Don't know of any one that approves that?

Q. Do you know of any treatise or book or authority to which you could refer us, supporting that practice?

A. No, I don't know of any—the name; not offhand, of a treatise on tank building, that I could refer you to tonight. It is the fact, however, that nearly all work of this kind, punched work, is done with the drift pin; and the fact that that is one of the commonest tank-maker's tools, would certainly lead me to believe, in the building of tanks to carry five or six pounds pressure, that this is the practical way to do it.

Q. Without troubling your memory to refer to some particular work that says some particular thing, could you refer us to a work that you regard as standard with respect to the construction of tanks, especially for gasoline or oil?

A. No, I can't give you any name of any tank building treatise. That comes generally under the head of Design, most engineers know, and most of the treatises or the descriptions are made by the tank builders. They have their

own specifications and formulas, based on the laws that come from the proper use and strength—and the proper application of mathematical formulas.

Q. You can't refer us to any particular one that you think would be of benefit to us?

A. Tank builders?

Q. I don't mean builders; I mean some publication.

A. I have read quite a number of books, but I can't refer you to the names.

Q. You saw the book put out by the Lancaster Iron Works, that we had in Court the other day?

A. That catalog?

Q. Yes.

A. I glanced at it; I think that was the name.

Q. Is that such a publication by a tank builder, as you have just described to us?

A. No, I think that would be very interesting and very valuable information, but there is nothing in that that would be of much value—of any supplementary value, to the information that I already possess, to enable me to properly express an opinion on the adequacy of these tanks.

Q. Well do I understand you that tank building is a specialty, which is usually performed by companies such as the Lancaster Iron Works?

A. R. D. Cole, of the Schofield Iron Works; quite a number of them.

Q. They are the people that usually do such work, is that right?

A. They make larger tanks; and innumerable people that make smaller tanks.

Mr. Matteson:

That is all.

Mr. Underwood:

That is all.

(Witness excused.)

4593 Thereupon MR. WIRTH MUNROE was recalled as a witness on behalf of Respondents and further testified as follows:

Direct Examination.

By Mr. Underwood:

Q. Mr. Munroe, last Saturday morning did you arrange for me to remove the four tanks from the Seminole and take them down to Warriner & Des Rocher's?

A. I did.

Q. Did you examine them there?

A. I did.

Q. Tell us whether or not you examined particularly the vertical seams for the purpose of ascertaining whether those seams were soldered.

A. I examined all four tanks to determine the amount of solder that could be found in them, and what if any was left intact.

A. And what did you ascertain as to the solder in the vertical seams?

A. On all the tanks with the exception of number three, the solder was decidedly prominent in the vertical seams—with the exception, as I say, of number three.

Q. How high up was it prominent in all but number three?

A. Approximately twenty to 24 inches.

Q. And how high up did it go in number three?

A. In number three it only extended up a few inches, two to three inches, and that was not in perfect shape.

Q. Above the point where the solder was decidedly prominent, to use your phrase, did you find any evidence of solder?

A. On practically all of them, yes.

Q. And what was that evidence? What did it look like?

A. There were small indications, or small particles of solder still remaining in the seam.

Q. How did you ascertain that?

A. By cutting it with a knife.

Q. How could you tell it was solder?

A. By its softness, and the color of the metal after it was cut.

Q. Were you able to form an opinion with reasonable certainty as to whether those tanks at their vertical seams had prior to the fire been soldered to the top?

A. In my opinion, all four tanks were definitely soldered clear to—or the full length of the side seams.

Q. Did you examine the seams around the top of the tank, between the crown and the vertical side plates of the tanks?

A. Yes, I examined the head crown and the seam, and in practically all of them I found small bits of solder still remaining there, wedged into that.

Q. How did you discover those? I mean, did you have any instrument to use?

A. I used a knife, and pried some of these bits out, and then cut them open with my knife, to ascertain the density of the material, as to whether it was zinc or bits of solder.

Q. And could you tell?

A. Due to the softness of the material, I determined them to be solder.

Q. In how many of the tanks at the top seam did you find that condition?

A. There were indications in all of them, I would say; not continuous all the way around, but there was evidence of it in practically every head. In number three tank there was quite a few of the bits.

Q. Are you able to express an opinion with reasonable certainty as to whether those top seams were, prior to the fire, completely soldered?

A. I believe they were. There was a distinct indication on the metal, slight discoloration along the seam; and the fact that these bits of solder still remained there, which had bubbled out of the seam.

Q. You have already testified that the bottom seam of number four tank was soldered. Did you examine the bottom seam of the other three tanks?

A. I examined the bottom of the other three tanks.

Q. What did you find, as to solder?

A. And found solder on all of them. That on the bottom of number three showed that there was considerable heat applied to it, but not enough to burn it completely away.

Q. You have heard considerable discussion here today about whether or not these tanks were caulked. Have you had sufficient experience with steel work to form an opinion with reasonable certainty, from your observations, as to whether these tanks were caulked?

A. No, sir; I haven't had sufficient experience on the manufacture or the use of tanks of this size to tell whether they had been caulked or not. I have never used a caulking iron in any of my business.

Q. At the tests that were run on tanks one, two and three, did you look to see whether there were any leaks around the bottom seams of those tanks?

A. I certainly did.

Q. Were there any?

A. There were none.

Q. Did you look to see whether there were any leaks around the outlet fittings?

A. There were no—I examined the tank all over, all the seams, and found no leaks around the parts that had been soldered, or the outlet fittings.

Q. How about the plugs at the bottom of the tanks?

A. I found no leak at the bottom plugs.

Q. Did you find any leaks in the vertical seams at any point where the solder was distinctly evident, I think your words were?

A. Yes, sir, there were minor leaks.

Q. Well were they above or below the point where distinct evidence of solder was?

A. They were all above the solder, the remaining solder.

Q. And what did the leaks look like above the solder?

A. With the application of the soapy water, they were just very small bubbles; hardly—some of them hardly any bigger than the point of this pencil, or a pencil lead.

Q. Was there any test of any kind applied to number four tank at Warriner's yard?

A. There was absolutely no test put on number four tank at Warriner's yard.

Q. Or any place else, within your knowledge?

A. There were no other tests applied on number four tank to my knowledge, except what tests I put on it.

Q. The one you have already testified about?

A. The one I testified on.

Q. Did you examine the outlet valve, or what remains of it, the outlet opening, to number four tank?

A. On number four tank, I examined all the outlet fittings on all tanks.

Q. Did you observe the condition of the outlet fitting at number four tank, as it is today?

A. Yes, sir.

Q. And did you observe what the mechanic—I have been referring to the wrong tank, Mr. Munroe; I mean number three tank.

A. Number three tank? Yes, I examined number three tank.

Q. I show you photograph, Exhibit #155. Did you observe what the mechanic did when he made a connection there for the air tests on that tank?

A. I did. I was right there when number three tank—was the first tank we tested.

Q. Were there any threads in that device before the mechanic began to operate?

A. There were absolutely no threads at all in that hole.

Q. What did he do?

A. He inserted a tap, a standard pipe tap in there and cut those threads, so that we could put a plug in it and seal it.

Q. From your examination of that device as it exists today, were you able to form an opinion as to what it is that remains there now?

A. I examined this thing very closely.

Q. Just first, were you able to form an opinion?

A. Yes, I was.

Q. And can you express an opinion with reasonable certainty as to what it is that remains there today?

A. I can.

Q. Have you drawn a sketch to show it?

A. I have.

Q. Let me see it.—Before I have this marked, I will ask you to indicate what the various pieces of it are. This I take it is the shell plating of the tank?

A. That is the shell plating of the tank.

Q. I will mark that 'Shell plating of tank'. And this I take it is the doubler?

A. That is the doubler plate inside of the tank.

Q. So marked. And this of course is a rivet?

A. That is the rivet holding the doubler plate to the shell plating.

Q. And this is a rivet on the other side?

A. That is a rivet on the opposite side.

Q. Now I notice a device that runs between them, or through the shell plating and the doubler plate, and that part of it is shaded and part of it is not. Can you tell me what that is?

A. Well the entire sketch, the entire thing running through, with the kagged edges indicating the threads, is a standard pipe plug, or reducer plug.

Q. This is the reducer plug?

A. That is the reducer plug, across there.

Q. And these jagged edges that you refer to, are the threads?

A. Indicating the threads on the plug.

Q. I mark an arrow to that; "threads". Now at the top of that there are also some threads; I won't mark those. Is that correct?

A. That is correct.

Q. What is the difference between the portion of that reducer plug which is shaded, and the other portion which is not shaded?

A. The shaded part is the part that still remains in the tank; and the unshaded portion of the plug is that which has been destroyed and knocked out in some manner.

Q. Do you have any knowledge as to how it got out, or what made it go out?

A. I have no knowledge at all.

Q. Then I understand it from your examination, it is your opinion that the thing that remains there today is that portion of the reducer plug represented on this sketch by the shaded portion; is that right?

A. That is correct.

Mr. Underwood:

I offer that.

(Said sketch was admitted in evidence and filed as Respondents' Exhibit 6-C.)

Mr. Underwood:

You may cross examine.

Cross Examination.

By Mr. Matteson:

Q. Mr. Munroe, I show you Exhibit 158, which I think you will recognize as a piece of the top section of the tank number four, showing the top part of the side plating and part of the crown in connection with it. You recognize that, don't you?

A. I do.

Q. Now with respect to these bits of solder that you say that you noted, were they in the crevice that runs along between the crown and the side seam, as we find it on this exhibit?

A. Yes, that's the point where those beads were found, wedged down in this open seam.

Q. That is, there was an open seam there that could retain solder?

A. The same as indicated—as on this exhibit. All tanks have that; it is where the turn of the crown meets the side plating.

Q. But there is—the point is that there is on the tops of all of these tanks a similar crevice?

A. Yes.

Q. Of approximately these proportions?

A. That is correct.

Q. And that is a crevice sufficient to retain globules of solder such as you have mentioned?

A. Yes.

Q. Now take this Exhibit 158; do you find any globules of solder in that?

A. I don't see any here at the present time. That has been pretty well handled and picked over, and it might have been moved.

Q. Do I understand that your testimony is that in your opinion the tops of all of these tanks were soldered around through that crevice or seam at the top?

A. That is my opinion; yes.

Q. In their original condition?

A. In their original condition; yes.

Q. Well now the point that you make is that because of the hot fire, that solder melted and ran away, and that is the reason we have no traces of it in Exhibit 158?

A. I will not say it was melted and ran away; I will say it was melted and oxidized to a powder and then blown away by the force of the fire.

Q. Are you a chemist?

A. I am not a chemist; no, sir.

Q. Now solder melts and flows at something less than five hundred degrees Fahrenheit, doesn't it?

A. That is correct.

Q. And at what temperature does it become a powder?

A. Well that I couldn't tell you.

Q. Do you know of your own knowledge that it ever becomes a powder?

A. I know from experience that under—and from what study of chemistry I have done, that any metal, if brought to a sufficient heat, will oxidize and become a powder.

Q. Well of course it has to have a supply of oxygen, doesn't it?

A. Yes, it has to have a supply of oxygen to do that.

Q. And you have seen the solderers working, with a pot of solder and a blow-torch to keep it hot, have you not?

A. I have.

Q. And the reason that that does not oxidize and blow away as it does is, I assume, because it is in a pot which confines it so the oxygen does not get at it; is that true?

A. I think I can explain that to you. I have handled quite a bit of Babbitt, which is just a little bit different form of solder, and also melted a great deal of lead for the pouring of ballast. And on the surface of the pot, a pot of molten metal, you will find an oxidation scum

which has to be removed before you can pour your metal, or ladle it out, and that scum on the top is nothing more than oxidation of the metal.

Q. Now are you speaking as a chemist?

A. No, sir; as a practical man.

Q. Well can you tell us that the scum that forms on the top of the solder is oxidation rather than impurities in the metal that is being melted? Have you ever made any test that would tell you that?

A. No, I haven't made any analysis of it.

Q. And you just assume that it was oxidation?

A. It is—it could be partly impurities, but it is also accentuated by the oxidation of the metal itself.

Q. Well now if this fire was hot enough to melt, oxidize and turn into a powder which blew away, large quantities of solder in the top seam, how do you account for the fact that these globules that you saw, remained?

A. Some that didn't completely oxidize.

Q. They were definitely in the form of globules, were they?

A. They were in the definite form of globules; yes, sir.

Q. Well now if there was a substantial quantity of solder in this top seam, and the tank was in a vertical position, and there was a hot fire, you would have in effect a small vessel sitting on the top seam, containing a certain amount of the molten metal, would you not?

A. Yes, you would.

Q. And can you suggest any other method by which that solder could be removed from that seam by a hot fire, other than this oxidation and wind that you speak about?

A. Well those tanks have been out there for a long time, and there has been plenty of rain on them, and wind, and everything else.

Q. The solder at the lower part of the seams hasn't oxidized, has it?

A. The solder on the seams still remains there; it has oxidized to a certain extent.

Q. Well, hardly sufficient to remove any part of it?

A. No, it couldn't remove it, because it hasn't had heat applied to it.

Q. Of course with the tank remaining in an upright position, the force of gravity alone would be sufficient to retain the molten metal in this seam, unless something else removed it, would it not?

A. I would say so; yes.

Q. You don't think it ran through the tank, or anything like that?

A. No, I think the seam was too tight for it to run through.

Q. Now this crevice in the top would seem to be a pretty good retaining place, wouldn't it?—about as good as you could get?

A. It would retain it probably longer than the side seams would; yes.

Q. Have you ever had any other experience with a quantity of solder retained in a crevice such as that, being oxidized to a powder and being blown away by the wind?

A. Not under the exact condition as this. The only other example that I could express would be a small amount of solder that was left—or lead that was left in a ladle, and the ladle remained over the fire before it was noticed and taken out, and that has been completely consumed, until there was no liquid there at all—no molten metal there whatsoever; nothing but a perfectly dry powder left in the ladle.

Q. As a matter of fact you know, do you not, that solder is not readily subject to oxidation?

A. No, it is not, unless the heat is sufficient.

Q. And it is because it is not subject to oxidation, that it is used for the purposes that it is used for, in the

soldering of seams or other points where vessels are wanted to be made tight?

A. I wouldn't say that that is the reason for it, no.

Q. Well that is one of the reasons for it, isn't it?

A. I wouldn't say that it was; no.

Mr. Underwood:

One of the reasons for what?

Q. Well if there is any misunderstanding between us, I will state the question again. One of the reasons why solder is used in exposed places for making a seam tight, or what not, is because it is not readily subject to oxidation—isn't it?

A. No, sir; that is not the reason for it.

Q. Well what are the reasons for it, then?

A. You mean the reasons for using solder?

Q. Yes.

A. The prime reason for using solder is because of its low melting point, and its adaptability to other metals, and making a tight joint.

Q. You say the fact that it is not readily subject to oxidation does not enter into it at all?

A. In my opinion it does not whatsoever; because you could use silver solder, you could use any kind of solder.

Q. Well of course silver solder would have the same quality of not being readily subject to oxidation, would it not?

A. It would not be very susceptible to oxidation either.

Q. When you want to use some kind of a solder, you would not use the kind of solder that was readily subject to oxidation, would you?

A. You wouldn't use anything that was subject to oxidation any more than the metal to which it was attached.

Q. Then if you were choosing the material for solder, you would take into account its adaptability to the metals

to be used, and the fact that it was a more or less permanent substance that was not readily subject to oxidation, would you not?

A. In that sense of the word, yes, I will agree with you. But I still contend that that is not the prime reason for the use of solder.

Q. Refer to, say, this Exhibit 160; do you agree that some of the galvanizing has been removed by the action of heat?

A. I do; there is decided evidence of heat on that.

Q. And what is the melting point of zinc? Do you know, about?

A. I am afraid I can't give it to you.

Q. Well it has a low melting point, has it not?

A. It is much lower than other metals; it is higher than lead.

Q. And the top of the tank was galvanized too, was it not?

A. Yes.

Q. And was some of the galvanizing there also removed by the heat?

A. I would say that there was—at least since the fire, the galvanizing has been affected. I should say—

Q. I am not talking about, since the fire; I am talking about the fire. Do you agree that the galvanizing was at least in part removed from the heads of the tanks as well as the sides, by heat of the fire?

A. I wouldn't say that the galvanizing was removed by the heat at the time of the fire; no. I will say that it was—the properties of it were destroyed enough that the elements since the fire have removed it.

Q. Well do I gather that you have the opinion that the fire wasn't hot enough to melt the galvanizing?

A. Not in all places, no.

Q. Well do you think it was in some places?

A. I do, in some places; direct indication of it in many places. There is one place right on this Exhibit 160, that

indicates heat enough to wrinkle or "alligator" the galvanized surface.

Q. Well if it is small globules than you found in the crevice at the top of the tank, isn't it quite possible that they may have flown from the galvanizing at the top of the tanks, as well as the solder?

A. No, because the globules that I found were decidedly lead; that is, the majority of it, was lead.

Q. Are you speaking now as a chemist?

A. I can't say that it is the opinion of a chemist, no.

Q. Well you couldn't be certain of that, could you?

A. I have handled quite sufficient of it to be able to tell by cutting it whether it was lead, tin or zinc.

Q. Which was it?

A. In my opinion it was lead—that is, solder.

Q. And is this what you call fifty-fifty solder?

A. I am assuming it to be 50-50 solder.

Q. That would be fifty percent lead and fifty percent what else?

A. Tin.

Q.—And what did you do with these globules of solder that you found in the top seam?

A. Well I didn't remove all of them; those that I did remove, they were so small that many of them that I pulled out, they fell on the ground before I could catch them in my hand,—and lost them.

Q. Did you retain any?

A. No, I did not retain any of them.

Q. Well that would have been valuable if you had. You didn't make any effort at all to retain them?

A. No, sir.

Q. Did you call anybody's attention to them when we were all down there either on Monday night or on Tuesday morning?

A. I called Mr. Underwood's attention to them, and I believe, Mr. Gibbs.

Q. You didn't call attention to Mr. Botts and Mr. Thompson and Captain Patton or myself, did you?

A. I didn't feel at liberty to call attention to any one except Mr. Underwood or Mr. Gibbs.

Q. Why was not tank number four tested?

A. Why was it not tested?

Q. Yes, on last Saturday afternoon.

A. Because the—one reason, we tested it before; a much heavier test; and the other reason was that when we arrived there that tank was practically filled with water for the purpose of cutting.

Q. Had you given instructions for it to be filled with water?

A. I had not; no, sir.

Q. Do you know who did?

A. I do not.

Q. You realize in some respects at least the test you held previously was not entirely satisfactory?

A. They were perfectly satisfactory to us.

Q. You don't recall testifying here before that in certain respects the test was not entirely satisfactory, that you made last spring?

A. Now that you call my attention to it, I believe I did make that remark; due to the fact that the leak in the plug that I had inserted in the filler opening, and the crack in the bushing in the lower opening—as far as hydrostatic test was concerned.

Q. Where is that cracked plug now?

A. I guess it is still in the bottom of number four tank.

Q. And is this the plug that is shown on the right hand side of that Labelants' Exhibit 153?

A. Yes, sir; that's the plug bushing that was cracked.

Q. Can you point out the crack to us?

A. I don't believe I can point it out on this photograph, no, sir.

Q. Did you examine it when we were down there on Saturday?

A. I showed it to some one, I don't remember who it was, whether it was Mr. Thompson:

Mr. Thompson:

No.

A. —or Mr. Patton. Some one asked me about it and I scraped the rust off of it, and showed them where the crack was.

Q. You say you saw the crack last Saturday?

A. I did.

Q. Or last Tuesday morning?

A. Yes; I don't know whether it was—Monday afternoon I believe was the day.

Q. Well can you indicate to us on this picture approximately where that crack is?

A. It would be merely a guess. I can show you where the general place of the crack is, but I can't tell you what face of that bushing in the picture it was on. I have nothing to go by to recall the exact crack.

Q. I examined it and wasn't able to find it. Were you present when the one, two and three tanks were removed from the Seminole?

A. I was.

Q. And was the condition of the wood pads underneath the tanks the same under one, two and three tanks, or similar, to what it was under number four tank?

A. I could not see that, Mr. Matteson, because it was covered to a depth of eight inches at least of muddy water. After we pulled the first tank, or number three tank, out, it muddied up the water so they couldn't see the pans at all.

Q. The water, first of all, in Pilkington's yard, is fresh, is it not?

Mr. Underwood:

I object to that as improper cross examination, and without any basis on the record, of the witness' knowledge.

Mr. Matteson:

I am just asking him if he knows.

Q. Do you know whether the water is fresh at Pilkington's yard?

A. I have not been to Pilkington's yard for a good many years; and I do not know whether it is fresh or not.

Q. Is it fresh at Nuta's yard?

A. Not absolutely fresh; it is brackish.

Q. It is practically fresh, is it not?

A. I do know that is brackish enough up there for certain growths, and I have been informed that there has been considerable salt water in the upper part of the River in the last few years.

Q. The Miami River discharges fresh water, does it not?

A. It does—it is supposed to; it hasn't been discharging a great deal up until the last year, at least not at that point anyway.

Mr. Underwood:

I didn't understand that; what is that point?

A. The freshness of the water; it is not completely fresh at that point.

Q. At Nuta's yard?

A. At Nuta's yard. I might add to that and state that the freshness varies a great deal, depending on the rainfall.

Q. Can you suggest any reason why the fire should have been hotter on number three tank than on any other tank?

A. I don't know that I have got any definite reason for that.

Q. The pans were under all the tanks, were they not?

A. They were.

Q. You didn't have the water level lowered sufficiently to determine definitely the condition of the wood pans under the tanks?

A. I did not; no, sir. We didn't pump any water out of her, and the tide was rising rather fast.

Mr. Matteson:

That is all.

By Mr. Botts:

Q. When you testify or propound this theory which you have propounded, with respect to the oxidation of solder, do you have any technical knowledge with reference to such an occurrence?

A. The general study of chemistry that I have had, and at school and since then.

Q. When you studied chemistry, did you ever at any time study or observe any statement of authority with respect to the oxidation of solder?

A. Not on solder, no.

Q. You studied oxidization generally?

A. Yes, sir.

Q. Then do you pretend to have, or claim, any technical knowledge with reference to the oxidization of solder, or the circumstances under which it would occur?

A. No more than I have already stated, Mr. Botts.

Q. Then such knowledge as you may have in that respect would have been gained by virtue of some observation of such an occurrence, and not as the result of a technical or scientific study; is that correct?

A. My knowledge has been—a large portion, is practical. I have read chemistry books and tried to inform myself on the subject of general chemistry.

Q. In these chemistry books that you have read, have you ever read a passage or sentence or discussion that directly mentioned oxidization as applied to solder?

A. I would not say, to solder only.

Q. As applied specifically to solder; then, you have never read anything of the kind?

A. Not to solder specifically, no.

Q. Now I understand you to say that on some occasion or occasions you had seen solder in a melting or soldering pot, where it was undergoing heat, you have seen it dissipate or completely oxidize and go off into the air?

A. The reason I didn't answer was because I didn't know whether you were through with your question or not.—Yes, I have seen that.

Q. All right now; then when you observed that, was there any residue left in your pot?

A. Oh yes.

Q. Now what was the nature of that residue?

A. And it's practically a powder in consistency.

Q. Now did you observe in the top seams of the tanks of the Seminole, any indication whatsoever of the existence of any such residue?

A. Oh no.

Q. You saw no evidence that any such residue had ever been there?

A. I wouldn't expect to find any.

Q. You didn't see it?

A. No, sir.

Q. This theory that you have propounded, as the result of which you conclude that the top seams were soldered, is based entirely upon your belief that you found some small globules of solder remaining; is that right?

A. That is not the sole basis of my opinion; no, sir.

Q. All right, what other basis do you have for it?

A. The other basis for my opinion is that there are strong indications where the acid flux had affected the

metal, in the way of the solder, when it was first applied.

Q. And what were those indications?

A. Discoloration.

Q. And you assert that you saw discoloration along the seams?

A. Discoloration, and the accentuation of oxidation of the metal, or rust, in some places, and the oxidation of the zinc or galvanizing in others.

Q. Now then in propounding the theory that solder had been there, and had been subjected to such great heat that it would completely oxidize, did you take into consideration the quantity of heat, that is the temperature, which would be required to completely oxidize solder?

A. Yes, I considered the heat; I had to.

Q. Are you aware of the amount of heat that is requisite to oxidize solder, if such phenomenon can be produced by heat?

A. Yes, I am perfectly aware of the amount of heat, and I took it into consideration.

Q. How much heat does it take then, if you know?

A. I can't give you the exact degree necessary, but I do know that there is also a period of time to be taken into consideration.

Q. I expect then you didn't quite understand the previous question when I asked you about taking into consideration the amount of heat; you don't mean then to suggest that you know how much heat applied to solder, will oxidize it?

A. I don't know the exact degree of heat; no.

Q. Then you wouldn't know whether or not the degree of heat requisite to oxidize solder, assuming that it is possible to produce the phenomenon by means of heat alone, is greater or less than the amount of heat to melt galvanizing, or zinc?

A. I do not know the exact degree, but I do know that it is lower than that of galvanizing.

Q. Then do you say that you know that a lesser degree of heat, applied to solder, will completely oxidize it, leaving nothing but a powder, when that degree of heat is less than the heat required to melt galvanizing?

A. I do, yes.

Q. You know that?

A. I do.

Q. How do you know that?

A. I know that from practical experience.

Q. Wait a minute now; do you know how much heat was present in this soldering pot when that solder oxidized?

A. No, I didn't stick any thermometer into it.

Q. Well then how do you know that that degree of heat was less than a degree of heat which would melt zinc or galvanizing?

A. Well because I know that the amount of heat, from practical experience, know that the amount of heat that it takes to oxidize solder is lower than that that it would take to oxidize galvanized iron.

Q. Mr. Munroe, do you mean to seriously assert that you can without any temperature gauge—thermometer of any kind—you can observe a pot of molten solder, and say that the temperature is for instance more or less than 500 degrees Fahrenheit?

A. I think I could, yes. I wouldn't tell you the exact temperature of it, no, in degrees.

Q. How would you do that? By looking at it?

A. By the manner in which it acts; yes.

Q. All right. Now then what manner do you refer to? You say you judge by the manner in which it acts; now tell us just exactly what you have in mind.

A. By the color of it.

Q. All right, then what is the color to which you refer?

A. The color of solder or lead; they are almost the same; it turns to an almost black—not jet black, but a

very dark grey; and as the temperature increases on the thing it has a rainbow color flowing back and forth across it all the time.

Q. At what degree of heat will that rainbow color manifest itself?

A. I don't know; I told you I didn't put any thermometer into it.

Q. Then how do you know how hot it is?

A. I know that it is too hot to save the metal; I know that.

Q. Beg pardon?

A. It is too hot to save the metal; in other words you are burning up the metal in your pot when you reach that point.

Q. But you don't know how hot it is when that metal begins to burn up, do you?

A. No, I do not know.

Q. Well then how do you know that it is less hot than the melting point of zinc?

A. Just from practical experience; just good common-sense will tell me; the fact that I have handled both of them.

Q. Do you mean to tell me that by common-sense, without any measuring instrument, you can tell whether the temperature of solder in the melting pot is 300, 400, 500, 600 or 700, or within any of those ranges?

A. No; maybe you have got me wrong; maybe I haven't said all of it. I do know from my studies that the melting point of lead or solder or tin or zinc is different; that one is higher than the other.

Q. All right, do you know what the melting point of solder is?

A. It is somewhere in the vicinity of 400 degrees; that is all I can tell you—or a little less. It depends entirely on the grade of solder.

Q. Now then do you know the melting point of zinc?

A. I am not sure, but I believe it is around 700; in that vicinity.

Q. Have you your Kent's Handbook here?

A. I have.

Q. Could you inform yourself of those points?

A. I think I can, if I can find the tables.

Mr. Underwood:

To save time, may we have somebody else look that up?

Mr. Botts:

I just can't very well go on until I have gotten that.

Mr. Underwood:

It might be possible to take up some other line. If you can't don't do it.

A. The index of this book, you have to go back and forth all the time. I don't mean this will give solder; this is individual metals. Here is zinc, 786.9 degrees is the melting point of zinc.

Q. All right, now solder as I understand it is a combination of lead and tin; is that right?

A. That is correct.

Q. What is the melting point of tin?

A. 449 degrees.

Q. And of lead?

A. 621.

Q. Then the melting point of solder, would it be somewhere between those ranges?

A. I don't know.

Q. See if you can find solder in there, and see if there is any table that gives the melting point of solder.

A. What happens with the combination of the two metals, I don't know; but I am sure that the melting point of solder is—

Q. Well the melting point of tin, you say is 449; was that it?

A. Well we will say 450, yes.

Q. Well the melting point of lead is 600 and something, isn't it?

A. Yes.

Q. Well the melting point of solder wouldn't be lower than either of the component parts, would it?

A. I am not sure about that. In my opinion—

Q. What is the melting point of lead?

A. I will have to find that table again; I have forgotten what page it was on. Melting point of tin, we will say 450; ~~449.4~~.

Q. And of lead?

A. 621.

Q. And of zinc?

A. 789—787 we will say; it is 786.9.

Q. Now the solder couldn't possibly melt at a lower melting point than the tin, could it?

A. I wouldn't think so; I don't believe it would.

Q. Then when it got to the point where it would become so overheated that it would oxidize and pass away as a gas, it would necessarily be considerably higher than the lowest melting point, wouldn't it?

A. It would have to be higher than the melting point; yes.

Q. All right.

A. But I wouldn't say, a great deal higher.

Q. If the melting point—if you were going to fuse it and have it entirely pass away in the form of a vapor, it would have to carry away both the lead component and the tin component, wouldn't it?

A. I wouldn't say it would pass away as a vapor, Mr. Botts:

Q. Well how does it pass away, then?

A. I say that it forms a powder; I don't say that it completely passes away.

Q. All right in order for it to melt and oxidize, if it was at a lower melting point then—now then take tin, for instance; it wouldn't oxidize until it had reached its boiling point, would it?

A. It would start oxidizing immediately on application of heat, and before it even started to melt.

Q. Well now then getting back to this oxidization; if you have tin and lead, if it started oxidizing the tin at less than the melting point of the lead, and that oxidization is caused by heat, until it got up to the oxidization point of lead it would merely take out the tin and leave the lead, wouldn't it?

A. It would; yes.

Q. Then in order for it to get to the point where it would oxidize the combination of metals, it would have to be above the melting point of the lead, wouldn't it?

A. To oxidize the lead, yes.

Q. And that is 621. Now then you say that from your observation, merely visual and without any instruments of measurement, you were able to tell that on the occasion when you saw this solder oxidized, which necessarily was above the 621 degrees necessary to melt the lead, that it was less than the melting point of zinc.

A. Yes, because the melting point of zinc is higher than that of lead.

Q. Now the melting point of zinc is 787, and of lead 621. Now then do you mean to seriously sit there and tell us, Mr. Munroe, that by merely looking at a melting pot containing solder, that you can tell that it oxidized and disappeared as a liquid, at a temperature greater than 621 degrees but less than 787 degrees?

A. You say, disappears as a liquid? I didn't say anything about that.

Q. You said it disappeared as a liquid and became a powder.

A. I didn't say it disappeared as a liquid; it does become a powder, yes.

Q. That is what I said; it disappeared as a liquid.

A. I don't understand your use of the words, disappearing as a liquid.

Q. When it becomes a powder it disappears as a liquid.

A. It changes from a liquid to a powder; yes.

Q. Then you say that solder—that lead-tin solder at a temperature of less than 787 degrees will oxidize and cease to be a liquid and become a powder, do you?

A. I do.

Q. And you say that you could tell that when this—by merely looking at it on the fire, or when subject to heat,—that you could tell that that lead-tin solder combination was of a temperature greater than 621 degrees and less than 787?

A. Absolutely.

Q. And you could tell that by just looking at it.

A. In a pot of solder there is no galvanizing present; no.

Q. Wait a minute; that isn't the question I asked you. I asked you if you could tell that that disappeared as a liquid at a temperature less than 787 degrees.

A. I know that it will disappear at that point, yes.

Q. That isn't the question I asked.

A. I am not a freak, Mr. Botts.

Q. No. I know that; I am not suggesting that you are.

A. I don't carry any feather in my hat or any thermometer in my eyes.

Q. Then you stated that you knew when that solder disappeared as a liquid and became an oxidized powder, it was at a less temperature than the melting point of zinc, didn't you?

A. I said—when I said that I meant that it would oxidize at a lower temperature; I didn't say that necessarily that all the time it was lower than that of zinc, no.

Q. I didn't ask you whether it would; I asked you

whether it did, and didn't you answer me that it actually did do that?

A. I did, and in my mind I was considering the difference in the melting point between that—or the oxidation point of lead and that of zinc.

Q. When you were observing this melting point, or this oxidation point, did you put your hand down to feel it?

A. I certainly did not.

Q. You just stood off and looked at it?

A. That is as close as I want to get to any pot of lead.

Q. And your observation then was purely by the eye?

A. Absolutely.

Q. And you say that by looking at a pot of molten solder you can tell that its temperature was less than 787 degrees?

A. I can; yes, sir.

Q. Now—and greater than 621 degrees?

A. Certainly.

Q. You can do that also?

A. I certainly can.

Q. Now then what phenomenon do you observe by the eye which enables you to deduct that range of temperature in those very—in that very hot liquid?

A. The very simple thing of deduction. Knowing that lead melted at a lower point than that of zinc. And that oxidation sets in at a very little bit above that of the melting point—

Q. How do you know that?

Mr. Anderson:

Wait a minute; let him finish his answer.

A. That if that was kept at a temperature below that of zinc—the melting point of zinc, your lead would be completely disappeared or dispersed into a powder in a

length of time. It will be accentuated by the increased heat, and the thing will oxidize and become a powder at a fast rate.—That is all.

Q. Either you can't understand my question or I don't understand your answers; so I want to try and propound the question in a different way, to see if you can get the answer. You have stated definitely that you can tell the temperature of that molten mass within a range between 621 degrees and 787 degrees.

A. Yes, there is a difference of 160-odd degrees there.

Q. All right; 166, we will say. Granted. You are looking at that molten mass, merely by your ocular observation?

A. Yes.

Q. Now then in order for you to judge that temperature, there must be some reaction in that molten mass at varying temperatures, which registered do your skilled ocular observation, and tells you this temperature is now 621; and later, it is less than 787. What phenomenon, visible to the eye, is present in that molten mass from which you make that deduction?

A. By simply the rapidity by which this scum—you might call it a scum,—forms on the surface of the molten metal.

Q. There is nothing in the color, change of color, of the metal, then?

A. There is a slight change in it, yes. As the stuff builds up it becomes a darker color, until finally the top of it is disintegrated into a powder.

Q. All right; now I want to know, what is it that you see in that molten mass that distinguishes it in the temperature between a temperature of 621 and a temperature of 687? What is it you see that is different?

A. I am afraid I am at a different line than you are, Mr. Botts. I am stating in my answers the point of oxidation of lead; I am not comparing it with that of the melting point of zinc, in actual degrees.

Q. Well you said you could tell.

A. I know, Mr. Botts, that oxidation sets in at a lower temperature than that of the melting point of zinc; I do know that.

Q. Well, how?

A. Why the simple fact that I know that the melting point of lead is lower than that of the melting point of zinc.

Q. All right, but how do you know how hot it is when it begins to disintegrate into a powder?

A. Because I do know that it begins to disintegrate into a powder at a lower—a little bit higher temperature than that of the melting point of lead.

Q. How do you know that?

A. From experience, Mr. Gibbs—I beg pardon; Mr. Botts.

Mr. Botts:

— Will you read the last answer.

(Preceding answer read by the reporter.)

A. I should correct that; the melting point of the material we are talking about, whatever it happens to be; whether it is lead, solder or zinc; whatever it is.

Q. Would you mind from this handbook giving me the boiling point of lead and the boiling point of tin, and the boiling point of zinc? Make it tin, first; what is the boiling point?

A. I don't know what they mean by the boiling point.

Q. Well would you mind telling us what it says there.

Mr. Underwood:

Are you merely asking him to read out of the book.

Mr. Botts?

Mr. Botts:

Yes.

Mr. Underwood:

Can't we agree on that, to save time?

Q. What does it say is the boiling point of tin?

Mr. Underwood:

Boiling point of tin, according to Kent's Handbook, is 3800 degrees.

Mr. Botts:

And the boiling point of lead?

Mr. Underwood:

Varies between 2900 and 3600.

Mr. Botts:

And of zinc?

Mr. Underwood:

1724.

Mr. Botts:

All right; thank you.

Q. Now what happens to this lead-tin mass constituting solder, between its melting point we will say of 621, for lead, and the boiling point?

A. I don't know, Mr. Botts.

Q. It remains a liquid during that period, doesn't it?

A. I assume it does; yes.

Q. Now then how would you tell from looking at that, when in the process of its forming a liquid but before reaching the boiling point that it passes this 787 degrees of zinc? How do you tell that, when looking at that liquid?

A. I don't believe I can explain it to you, Mr. Botts, so you could understand it, in my own language.

Q. I think I can understand it if you can explain it.

A. I doubt that.

Q. Well would you mind bearing with my ignorance and explaining it, if you can explain it—whether I understand it or not? Maybe we will get a smart man that can understand it.

A. I prefer not to try it.

Q. Then you mean to say that you can't point out any—do I understand you to admit that you can't point out any phenomena apparent on that liquid that is a predicate upon which you could base a statement that that temperature has now passed 787 degrees?

A. I don't think I can, any more than what I have already said.

Q. All right. What are those phenomena to which you have already called my attention?

Mr. Underwood:

Do you mind if I object, on the ground it is repetitious?

Mr. Botts:

Not a bit; because I want him to summarize it now, since you have said—

Mr. Underwood:

Is this argument; I thought the Judge warned us against it.

Mr. Botts:

No, I don't think so.

Q. I want you to summarize what you say are the phenomena upon which you predicate your suggestion.

A. The same as I said before; the characteristic of the scum as it is forming on the surface of the molten metal.

Q. What particular characteristic do you allude to?

A. I am alluding to the color of it.

Q. Now we are getting somewhere.

A. As I said that before, I told you the color of it.

Q. What color is produced between 621 degrees and 787 degrees which is characteristic of that range of temperature?

A. I can't tell you between those exact figures, Mr. Botts.

Q. Well then you can't tell whether it had reached 787 or not, can you?

A. I know what the characteristic is, as it enters any heat.

Q. All right, as it enters any heat you know that, but you don't know any particular characteristic that would be observable between the ranges of 621 and 787, which would mark off a point when you could say it has reached beyond 787,—do you?

A. I think it would be a lot easier for me to express what you are trying to drive at, Mr. Botts, by stating that I have seen definitely, when removing solder from a galvanized iron surface, I know that I have removed it—completely clean, by the use of heat, and not damaged the zinc to any appreciable extent.

Q. Melted it off, in other words; is that right?

A. It was melted off, the majority of it; and the remaining—the thin, what has been spoken of as the tinning, which is a very thin layer, has been oxidized off.

Q. Now then, you have told me that the melting point of solder is less than that of zinc. So it would melt off of a zinc surface without melting the zinc, wouldn't it?

A. Absolutely; that is what I am trying to tell you.

Q. But that isn't the question I am trying to ask you.

A. Because—but I don't want to argue with you.

Q. No, because I am asking the questions. Now you have finally stated, unless I have misunderstood you—

and if I have, please correct me—that you, by your eye, can tell by observing a melting pot of solder, that it had not in a given condition reached the melting point of zinc, of 787 degrees.

A. I said that it had started to oxidize at a lower temperature—I know lower temperature than that—

Q. Do you mean to tell me now that you cannot tell whether that melted substance has reached the melting point of zinc or not?

A. No, I don't think I can tell you whether it has reached the melting point of zinc, or exceeded it.

Q. Then you can't tell by your ocular observation when it reaches 787 degrees; is that right.

A. That is correct; yes.

Q. Then if I understood you previously to say that you could tell by observation, I was mistaken?

A. You were mistaken in my answer, I am sure.

Q. Then—

A. Or I was mistaken in the ideas that you were trying to arrive at. I was talking about the oxidation—that when oxidation sets in—

Q. That wasn't what I asked you. Then as I understand it now—and let's be sure we understand each other this time; you are wholly unable to tell by looking at a melting pot of solder, whether it has arrived at or passed the temperature of 787 degrees; is that correct?

A. I could not tell you whether it had reached that degree or exceeded it; no; not by looking at it.

Q. Then you are unable to tell whether or not, when this quantity of solder completely oxidizes and becomes a powder,—you are not able to tell whether it had passed the melting point of zinc or not,—aren't you?

A. I can tell you that the solder begins to oxidize very shortly after it reaches its melting point.

Q. Now how soon after? Fifty degrees, 100 degrees?

A. I would say less than 100 degrees, yes.

Q. Now then how do you tell that it has not increased above the melting point more than 100 degrees?

A. From the statement that I made a few minutes ago, Mr. Botts; the fact that I have melted solder off of a galvanized object.

Q. Now you are getting into—

A. No, I am at the same point I was before.

Mr. Botts:

Read the question, please, Mr. Bryant.

A. It is a very erroneous question that you are trying to ask, Mr. Botts.

(Discussion was had between counsel for Libelants, off the record.)

Mr. Botts:

That is all.

Mr. Underwood:

It is understood that the case is closed on behalf of all parties, with the exception that Mr. Matteson has the privilege of recalling Mr. Thompson to the stand, and one or two other witnesses, if he chooses, to testify concerning the question of whether or not these tanks were caulked; all that testimony to be in New York; and that I have the privilege thereafter of taking further evidence if I so desire, to rebut such matters as Mr. Matteson may bring out from any one or more of the three that he is privileged to call.

Mr. Matteson:

I may want to ask the witnesses in New York a few questions about the rivets, but the principal thing will be the caulking.

Mr. Underwood:

As long as it does not extend beyond that, I will agree to this procedure; but if the case is to go on to any greater length than that,—any substantially greater length than that, I see no point in doing it, and would prefer to stay down here and finish it right now.

(Following discussion off the record, at 8:50 o'clock p. m., November 22, 1939, taking of testimony before the Commissioner was concluded, with the reservations above noted.)

State of Florida,

County of Dade, ss. .

I, Ernest L. Bryant, heretofore duly appointed to take the testimony of witnesses on behalf of Libelants and Respondents, in that certain cause now pending and undetermined in the United States District Court for the Southern District of Florida, Miami Division, in Admiralty, wherein Charles Coryell, et als., are Libelants, and George J. Pilkinton and John S. Phipps are Respondents, do hereby certify that on November 21st and 22nd, 1939, there personally appeared before me at Room 209, Federal Building, Miami, Dade County, Florida, John A. Thompson, J. N. Patton, Alfred F. Warriner and C. E. Stevens, witnesses on behalf of Libelants, and George W. Gibbs and Wirth Munroe, witnesses on behalf of Respondents; that said witnesses were by me duly sworn to testify the truth, the whole truth and nothing but the truth, in the cause aforesaid; that the testimony then given by them was reported by me in shorthand and afterward transcribed by me or under my supervision; and that the foregoing transcript of testimony taken on said dates of November 21st and 22nd, 1939, is a true and correct transcript of said testimony so given. I further certify that at the taking of said testimony, Leonard J. Matteson,

Esq., and David W. Dyer, Esq., of Proctors for Libelants; Fred Botts, Esq., Proctor for Respondent George J. Pilkington; Eugene Underwood, Esq., and Robert H. Anderson, Esq., of Proctors for Respondent John S. Phipps.

I further certify that I am not of counsel for nor in any way related to any of the parties to this cause; nor am I in any way interested in the outcome thereof.

In Testimony Whereof I have hereunto set my hand and seal this eighth day of December, A. D. 1939.

ERNEST L. BRYANT,

(Seal)

Commissioner.

United States District Court, Southern District of Florida,
Miami Division.

Charles Coryell, et al., Libelants,
against

George J. Pilkington and John S. Phipps, Respondents.

Further depositions taken on behalf of the libelants, at the office of Messrs. Bigham, Englar, Jones & Houston, 99 John Street, New York City, December 6, 1939.

Appearances:

Messrs. Batchelor & Dyer, Messrs. Bigham, Englar, Jones & Houston (Mr. Matteson) for the libelants.

Messrs. Loftin, Stokes & Calkins, Ray C. Alley, Esq.,

Messrs. Burlingham, Veeder, Clark & Hupper (Mr. Underwood) for John S. Phipps.

It is stipulated that the testimony may be taken by a stenographer, signing, filing and certification being waived, stenographer's fees to be taxable.

4637 EDWARD ELLSBERG, being duly sworn and examined as a witness for the libelants, testified as follows:

By Mr. Matteson:

Q. Commander Ellsberg, what is your business?

A. Consulting engineer.

Q. Where is your office?

A. Westfield, New Jersey.

Q. Will you outline for us your educational and practical experience which qualifies you as a consulting engineer.

A. I am a graduate of the United States Naval Academy, class of 1914; a graduate of the United States Naval Post Graduate School at Annapolis, 1916, Bachelor of Science; a graduate of Massachusetts Institute of Technology, in naval architecture and Master of Science; I hold a degree of Doctor of Engineering from the University of Colorado, granted in 1929; naval constructor in the Navy from 1917 to roughly 1925; I have been outside superintendent and repair superintendent at the New York Navy Yard and the Boston Navy Yard, and have had under my direct charge the construction of four large ships, and the repairs to hull and machinery of probably one hundred or two hundred more—quite a number. Since 1926, when I resigned from the Navy, I was chief engineer of the Tidewater Oil Company for nine years, during which time I had charge, in my department, of the design and the erection and construction of oil tanks for gasoline and other types of petroleum oils, to the extent, probably, of several hundred tanks, from small sizes up to 80,000 barrel tanks. As a part of this general education in the beginning, I was taught the use of various tools that are involved in the different operations, and after that time I was a supervisor in charge.

Q. You have written a number of books, Commander Ellsberg?

A. I have written a number of articles having to do with the designs and the violations of ship and ship structures, some other articles on petroleum, and several books that have had to do with salvage work, and some other books that have no bearing on engineering.

Q. You, as a matter of interest, had something to do with the raising of the Submarine S51, was it?

A. Yes, I was salvage officer on the salvage of the S51, which lasted nine months, from about September 1925 to July 1926, and was salvage officer on the Submarine S4, also in 1927, for the initial period of several weeks.

Q. Some of your books have dealt with those operations, have they not?

A. Yes, two of them have.

Q. What are the names of these books?

A. "On the Bottom" dealt with the salvage operations on the S51, and a later one recently published "Men under the Sea" dealt with the salvage operations on the S4 and with certain other salvage expeditions. I may add also that as a consulting engineer at the present time, my work is mainly in the field of petroleum engineering but not wholly.

Q. Do you have some clients, as consulting engineer, that you advise continually on such matters?

A. No, I have no definite retainers at the present time, the cases are mostly separate ones.

Q. Are you familiar, Commander, with the process known as caulking, as applied to steel plating in steel tanks?

A. Yes.

Q. Will you describe to us what that process is?

A. In connection with any ship structure or oil tank, or as a matter of fact a water tank or any tank which is intended to hold liquids, it is necessary, in order to make the structure or the tank tight against leakage, if

it is a riveted structure, to caulk the seams of that tank. If it is a welded structure, the welding is relied on for that purpose. In connection with caulking, which is common for all riveted structures, whether they are ships or tanks, the requirements are that the plates—

Mr. Underwood:

I object to any recitation of requirements unless they are the opinion of the witness himself.

The Witness:

Well, this is my opinion.

A. (Continuing.) My opinion shows definitely that to secure tightness, it is necessary that a riveted tank or ship structure be caulked, and my own actual experience in that has been that to secure a tightly caulked job, it is necessary that the two plates first be neatly fitted and properly and securely held together by adequate riveting; that after that has been done, the edge of one plate is required either to be chipped on the job to a smooth, and usually a slightly beveled edge, unless that plate, before it has left the shop, has been planed to the same smooth edge, slightly beveled; that after it has been erected and riveted in the tank or the ship, the requirement is that a caulker shall chip the edge, if it has not previously been chipped. That is a necessary thing, because the plate has only been sheared, but it is not necessary in case the plate has been planed properly in the shop; that with the edge of the plate either chipped or planed, the caulker next, with a caulking tool, takes the overlapping plate and goes through an operation which is called splitting, in which at about half thickness more or less a tool is run over the edge of the plate so as to divide the plate to some degree into two sections, one of which is forced toward the underlying plate. When that has been done, a caul-

ing chisel, ordinarily with somewhat round edges so that it will not cut into the underlying plate, is then run back and forth over the split plate so as to mechanically force the metal of that plate into intimate and very tight contact with the underlying plate; and during this operation, the edge of the top plate, which is being caulked, is left with a very decided depression where the caulking tool has been run back and forth above it. This depression normally varies with the thickness of the plate being caulked, but would ordinarily have a minimum depth of about $1/16$ of an inch. The object of this is to bring the two plate edges into very intimate contact so that there is no opening through which a liquid can seep. The necessity of caulking, and the care and skill with which it must be done, is greater when the tank contains oil than it is in the case of water, and is greatest when the oil to be contained is a light liquid like gasoline, which requires the very highest standards of workmanship to make a tightly caulked joint. That relates to the seams. Now, I don't know whether you include in that question the caulking of rivets, or is that a separate one?

Q. Yes, I think you may tell us about the caulking of rivets at the same time.

A. It is furthermore my own actual experience that in order to keep the riveting tight in a tank which is to hold liquids and particularly oil, that it is necessary to countersink the rivet holes in the outer plate, and that it is necessary and usual practice to drive what are called countersunk point rivets so that the rivet itself, while being driven, is completely expanded into a somewhat conical hole in the outer plate so as to make a tight joint in order that liquid will not leak along the shank of the rivet from the inside of the tank and escape around the point. It is further necessary, and more particularly necessary, with oiltight work, but it is usual with water or with any liquid, that the holes through which the rivets

are driven must either be drilled holes, or else if they are originally punched they must be punched small and then reamed out with a reamer to full size so as to get a fair hole through which the rivet is driven, so that the rivet may have a chance completely to fill that hole and give it a tight job. My ordinary practice for both tanks and ships, and my observation is, that to secure tightness with liquids, it is necessary to have countersunk point rivets, properly faired holes, properly driven, and finished off rivets caulked into the countersinks and caulked edges on the plates both for joints and for butts.

Q. Commander Ellsberg, just so we will have it clear: What is a reamer?

A. A reamer is a --it looks something like an ordinary drill, but it differs in that the angle of the flukes are much sharper, and it is deeper. The point of the reamer is much smaller than the major body of the shank, and to a degree conical, so that the small point is inserted in the hole in the plate which may not lie wholly fair and true, and then as the reamer is forced through, being operated by an air drill, it cuts away the metal surrounding the punched hole, which is weakened by the punching, and as the expanded shank of the reamer goes through, the hole gets larger, and in a proper reaming job, then when the reamer has been punched all the way through so that you come to the parallel section of the reamer, which is a cylinder, you are left with a fair hole.

Q. What is a fair hole, as a matter of terminology?

A. A fair hole is one in which, even though it may be at a slight angle with the plates, the hole in the lower plate and the hole in the outer plate, the sides are completely parallel through and through, with no space where one plate has a larger hole than the other. So that you are left, even though the hole may not be perpendicular to the plates, with a hole that is at least cylindrical along its own axis.

Q. What is this tool that I show you?

A. This is a caulking chisel.

Q. Is that the type of tool that is ordinarily used in the process of caulking that you have described?

A. Yes, this is a tool which is normally used to finish the caulking job and to force the caulked metal of one plate against the metal of the other.

Mr. Matteson:

I offer it in evidence.

It is marked Libelants' Exhibit 163 (Ellsberg).

Q. I notice that this tool has a straight axis from one end to the other?

A. Yes.

Q. Is that essential in a caulking tool or not?

A. Well, that is common, but some caulking tools, where you have to get into difficult corners or in tight spaces, are also made with the working edge of the tool curved somewhat, and they will be made to different degrees or curvature depending on how you hold your hammer, and still get the point of your caulking tool in on the edge of the plate. That is an ordinary caulking tool for average work that is normally accessible to the caulker.

Q. The curvature you speak of would be at the point of the tool?

A. Yes, at the point of the tool.

Q. I show you here what purports to be a drawing of a caulking tool, which is in two parts, one designated "Plan" and the other "Elevation". Would that be a usable caulking tool?

A. That is a usable caulking tool. I have seen some offset caulking tools of this general nature, and this might be used in order to permit the caulker to get in on some set-up where, with a straight tool, he might not be able to

reach it so well. Of course this is not, and I don't suppose intends to be, a complete working drawing of such tool, because this end here would normally—the end away from the point—would normally be of smaller diameter and would be a cylinder to go into the caulking hammer.

Q. I have here two plates—a piece of a plate—3/16 inch plate—joined together by rivets. Can you illustrate from these the process of caulking that you were describing to us?

A. Yes. On these two sections of 3/16 inch steel plate which have been riveted together, one side illustrates the stages of caulking. A part of the plate has been either planed or chipped—it looks to me as if it had been planed—and on that same side the edge which has been planed—half has been caulked against the lower plate so that as these two plates are examined, one part has been completely caulked, and the job is finished, and the other part has been—well, one might say—about half done, in that the edge has been smoothly finished by planing here to remove the strained metal which would result from the shearing operation when the plate was first laid out, and it is also evident, as you look at this as a caulked job, that the edge which has simply been planed and not caulked, is not quite in contact with the underlying plate, that is, it is possible there to insert the point of a knife between that, so there has been no watertightness achieved or oiltightness on that part of the joint, but the other half over which the caulking tool has been run for a finish has had roughly half the plate caulked tightly down against the underlying plate, and brought into forcible and intimate contact with the plate beneath it so that that edge has been caulked and is now tight against oil or water.

Q. Just to make it clear. These rivets for fastening these two sections together have round heads on one side and are not flush with the plate, and on the other side

have flattened ends which are more nearly flush with the plate. You have been speaking of the seam on the side where the flattened ends of the rivets appear?

A. Yes. I may add, on the subject of caulking, that the points of these rivets have also been caulked so that as they were first driven and finished off and flushed in what, in this plate, are countersunk holes, the rivets have been finally finished with a rivet caulking tool which has gone around the edge of each one of the points of these four rivets to force the metal firmly and finally into the countersink. This rivet caulking tool differs from the average seam caulking tool, in that it is curved to a radius of a size to suit the rivet point and it has a much thinner edge and a partially tapered edge in distinction with the tool which is used to caulk the plate edge itself. The opposite side of this same plate is not caulked. The opposite side of the plate, as distinguished by having the heads of the rivets hemispherical heads protruding above the plates, is the sheared edge of the plate as it comes from the shop, and that edge has not been either planed, chipped or caulked. It is also observable, looking at that, that the two plates do not lie in firm and intimate contact, and it is possible to get the point of the knife in between them, which is normal with plates which have not been caulked.

Mr. Matteson:

I offer those two plates in evidence.

They are marked as Libelants' Exhibit 164 (Ellsberg).

Q. Commander, I have here some sections cut from tanks of the Seminole, which is involved in this litigation, and I would like to ask you with respect to the seams appearing thereon, whether or not they have been caulked? In the first place, I will refer to Exhibit 157.

The interior side thereof has some arks in blue chalk placed by another witness in the case, and I ask you to examine that and tell us whether that seam has been caulked either on the inside or the outside.

A. (Examining same.) No, this plate has not been caulked, either inside or outside.

Q. How are you able to determine that?

A. First, with respect to the inside: It is evident that the inside of the plate very definitely and markedly shows the sheared edge as it came from the shears, with the direction of shearing from the outside towards the inside; and with a very marked space between the two plates, which shows that the edges have never been forced into contact. Secondly, the edge of the inner plate shows that it was never chipped and never planed, and it shows absolutely no sign of a caulking tool ever having been run over that seam to force the metal against the outer plate. The outside seam also shows no signs of having been either chipped, planed or caulked, and there is a complete absence of the depression line which is formed when a caulking tool is used to run over the edge of an overlying plate to force it against an inner plate. The outer plate has evidently been sheared from the outside toward the inside. There is very definitely no evidence of a caulking tool ever having been run over that plate.

Q. When you use the phrase "from the outside toward the inside" with respect to shearing—

A. I mean toward what would have been the center of the tank as these plates are assembled. I may say further that there is absolutely no evidence that any of those rivets were ever caulked either.

Q. Yes, I was going to ask you that. You say there is no evidence that the rivets were caulked?

A. No, the rivets have never had a caulking tool on them.

Q. Are you familiar with the process of soldering, Commander Ellsberg?

A. Yes.

Q. And with the properties of solder?

A. Yes.

Q. Can you tell us, referring still to the same Exhibit 157, whether there has originally been, or whether there has at any time been, soldering along the outside seam or around the rivet edge of this section of the tank, bearing in mind the fact that this tank is supposed to have been through a hot fire?

A. I have examined this sample previously, and examined it again now. I would say that absolutely there was never any solder on the outer seam of the plate marked 157. It is still evident along the seam, on the lower plate particularly, the remains of the galvanizing, and it is quite evident, looking at that, that there never has been any solder laid along any part of that joint, either on the lower plate or on the plate edge of the overlying outer plate—that was never soldered at any time.

Q. How are you able to determine that?

A. If this joint had once been soldered, there would have had to be a bond between the solder and the galvanizing on the underlying plate which is galvanized, and a bond made by tinning between the sheared edge of the overlying plate, which edge is not galvanized, and the solder, and if there had ever been any solder on that joint, the evidence of the tinning still adhering to the galvanizing on the underlying plate and to the exposed steel edge on the overlying plate would still be visible. There is none whatever.

Q. And you say that in spite of the fact that I tell you the evidence is this exhibit has been through a hot fire?

A. Yes, even though it had been through a hot fire which had been hot enough to melt out and run off the mass of solder, the tinning effect would still be visible against the galvanizing, and any fire which would leave the galvanizing would still leave some of the tinning. In

particular, at one end of this, where the plates are slightly separated, and a knife edge can be inserted, if there ever had been any solder on that joint, there would be some solder in there which might be scraped out with the knife, but there is none—nothing but rust.

Q. I show you Exhibit 159, which is also a section of the same tank and which has some evidences of solder on it, and tell you that this was cut from the original tank with an acetylene torch. Can you show us on this exhibit anything which illustrates what you have said with respect to the traces of the removed solder by heat after it has been applied?

A. Yes, on Exhibit 159, which at one time evidently had the outer joint only soldered from one end of 159 to the other end, it is apparent that the solder that originally was laid up on this joint is still practically all there except at the top and bottom edges of the seam where it has been, to a fair degree, melted away. The evidence of this plate would show that the major part of sample 159 has never had enough heat on it to melt the solder, but that at both ends, where 159 was cut out of the original tank with the torch, and evidently an acetylene torch, from the looks of the edge, that the metal at those edges had to be raised to a temperature of roughly 3000 degrees when the steel was burned, and that the action of that high temperature melted the solder for a distance of roughly an inch and a half from each end, but that it still, in spite of that very high heat, it has left a very perceptible coat of tinning on both what was the galvanized under plate and on what was the un-galvanized sheared edge of the overlying plate, and that on this sample which has been exposed at the edges to a very high heat, that tinning is still very distinctly in evidence. In most places it is bright, but where it has been darkened by some dirt, a slight scraping with the knife immediately restores the brightness and shows the tinning still left on the metal.

in spite of the fact that the metal at these points has been exposed to a temperature high enough to set steel on fire and start it burning. That tinning, still visible, goes up to the very burned edge of the plate at both ends, where the heat was highest.

Q. Before we pass this exhibit: Can you tell us whether those plates have been caulked in the places where the edges are visible?

A. The overlying plate, where the edges are still tinned, shows no sign of a caulking tool ever having been in contact with it, and the fact that a knife can be inserted through the solder between the two plates shows that the edge of the overlying plate has never been forced mechanically into contact with the underlying plate by a caulking tool. The inside seam on this same sample, Exhibit 159, also has never been caulked.

Q. Commander, there has been a suggestion that the evidences of caulking on the plate edges on these two exhibits, 157 and 159, may have been destroyed by the fact that the plates are said to have been through a hot fire. What is your opinion with respect to that?

A. I would say that that is very definitely not so. On plate 157, the exposed edge of the overlying plate outside shows here and there still some of the shearing marks that were left on the edge of that plate when it went through the shears, and the caulking mark is always very radically deeper than the slight folds in the metal you get when it is sheared and consequently, if there had been any caulking depression left, it would still be markedly in evidence. It is certainly missing from this plate.

Q. Do you, in your opinion, see any evidence of distortion or destruction of any part of the plate by a hot fire?

A. No. Exhibit 157 still lines up practically true and probably as straight as it ever was, and with the same general curvature that it originally had. There is no evidence of perceptible buckling in this plate due to a fire.

Furthermore, the galvanizing on the outside shows—except where the edges have been burned by a torch—no particular signs of ever having been subjected to a fire hot enough to have made the metal red.

Q. Why do you say that?

A. The melting point of zinc is around 700 degrees. The point of redness of steel is roughly around 900, and from there a little bit up, and if you had gotten a temperature that had been high enough to get this steel anywhere near a red heat, it probably would have burned the galvanizing off in a very considerable degree—there is no evidence of that. The galvanizing simply looks like old galvanizing normally would, with a coat of whiteness. I have seen plenty of steel that has been through fire in gasoline tanks, and some abroad, and where you get a considerable amount of heat there from a fire, you get a very visible and obvious buckling or distortion, of which there is no evidence here.

Q. With respect to the galvanizing which you mention, can you determine from the inspection of this Exhibit 157, whether the tanks was galvanized after manufacture or not?

A. Yes. These plates, and the plate edges and the rivets, very decidedly show that this tank was built of galvanized plates that were galvanized before assembling, but that after the job was assembled and riveted up, there was no galvanizing of the tank as a completed tank. The plate edges which have been sheared, both inside and out, show no evidence of galvanizing, and the rivet points are simply the ordinary metal of the rivet with no evidence of galvanizing. The heads show none either, and most conclusive of all: If this tank had been galvanized as a whole, after it had been riveted up, the seams would have been full of the molten zinc, and the seams, and particularly the inner seam of this sample (Exhibit 157) show no evidence of any molten or liquid

zinc ever having entered them. This sample was never galvanized after it was riveted up.

Q. Do you see, or can you tell us, whether the rivets have at any time been soldered, either on Exhibit 157 or Exhibit 159?

A. The rivets on Exhibit 157 have not been soldered on the points. The rivets on 157 have not been soldered on the heads. On Exhibit 159, the rivets were never soldered on the points and they were never soldered on the heads either. There is no sign of any soldering having been done on either the heads or the points of the rivets on either one of these samples. There is slight evidence that on Exhibit 159, a little of the solder that was used in soldering of the seams dripped over toward two of the end rivets and touched those rivets on one side only. The evidences of tinning, where that solder ran over, are still plain on those two rivets, but the rivets themselves were not soldered.

Q. We will pass to Exhibit 160, which is another section cut from the same tank, and ask you whether you can tell us whether the seams on that exhibit have been caulked either on the inside or out?

A. Sample No. 160 is a particularly good example of a very poor job of assembly without caulking. The outer seam very clearly shows the original shearing marks of the plate, which in this case was sheared from the inside toward the outside.

Q. Referring to the axis of the tank?

A. Referring to the axis of the tank, and the line of shear is clearly shown to have run off the true line and then about the middle of the plate it was shifted in the shear and a new shearing line was started, leaving a corner about an eighth of an inch deep in the edge of the plate. If this plate had ever been planed for caulking, you would have had a true straight line instead of this irregular line with a corner in it. If it had ever been

chipped for caulking, the caulker would have chipped away this corner left in the shearing of the plate and given himself a smooth curve against which he would then have run his caulking iron. The edge of this plate shows absolutely no sign of ever having been planed, chipped or caulked. The inside edge of the same sample (160) is very clearly simply the sheared edge of the plate, sheared from the inside toward the outside, with the two plates not in very good contact, and open for the insertion of a knife edge at a number of points. The inner plate edge was never planed, never chipped and never caulked. The rivets also very clearly were never caulked either inside or outside, and are good examples of very poor riveting.

Q. Will you point out what you have in mind with respect to that?

A. The points of these rivets on the outside are cracked and split in various places. The edges of the rivets do not come down in tight contact with the metal of the outer plate, and the work was either done by a riveter who was unskilled in the trade or careless in the type of work he was turning out. I may add here that the evidence of the points of these rivets also indicate that they were driven cold, since this cracking and the lack of a fair smoothly finished point is evidence that the metal was hammered down in the cold state. It is a particularly bad joint all the way through—sample 160.

Q. From the workmanship on these three specimens which you have examined and commented upon, what is your opinion with respect to the fitness of tanks so constructed for holding gasoline?

A. The tank is completely unsuitable as a container for gasoline, it is unsuitable in the workmanship on the plates, it is unsuitable from lack of caulking on the seams, it is unsuitable from every poor riveting, and with gasoline in this tank you could expect seeps around rivet

heads and around the seams. It is the type of tank that is very evidently never designed for holding gasoline, and the type of tank which anyone who was acquainted with the difficulty of holding a penetrating liquid like gasoline in a tank would reject immediately for that service.

Q. What is the difficulty of holding gasoline?

A. Well, in a tank that is built for holding water, you can get away with a moderate amount of poor workmanship, and, if the tank is not to be under pressure, with a fairly bad job, because the water leaking through around the rivets and through the seams will ultimately cause rusting on the rivets of the seams, which will give you a fair degree of tightness with water; if however, you put gasoline in a tank, in the same tank, either before or after it has had water—if you put it in when the tank was brand new you would immediately get bad leaks immediately—but if the tank has previously been used for water so that it has had a chance to rust up around the shanks of the rivets and through the uncaulked seams, then it would hold gasoline to a moderate degree and perhaps even for a short time well until the gasoline has cut through the rust. Any oil, and gasoline in particular, instead of rusting a metal and sealing itself up, will cut away the already existing rust and cause a leak which will gradually increase in amount as the years go on. Consequently, a tank to hold gasoline has got to be properly built and properly maintained, or you will have leaks in it, whereas the same kind of a tank, or even a worse built tank will hold water satisfactorily, and particularly when the tank is not under pressure. Furthermore, a small leak of water which would make no difference, because the water has no intrinsic value of its own and will do no damage, can be stood, whereas the same loss of gasoline is highly dangerous.

Q. You used the term "bad leaks", Commander—what did you have in mind when you said you could expect bad leaks?

A. Well, if the tank has been previously made tight because of the rusting of the rivets and the seams, what you will have, once you have put gasoline in it, and the gasoline has had a chance to work on the rust, is that it will seep through here and there in weeps and drips, and will, of course, as it runs out, evaporate. It doesn't mean, unless you had a clear hole through here, that you would have a stream of gasoline shooting out under pressure or squirting out.

Q. Does this defect in the shearing to which you called attention on Exhibit 160, have any bearing on the tightness of the tank?

A. Well, it merely—in this particular instance has a worse lack of fit of the outer and inner plate at that point than a properly sheared plate would have had. As a matter of strain, if this tank were intended to be used under pressure, either for water or oil of any kind, the plate should have been rejected by the Inspectors, because you don't get the proper distance from the plate edge to the line of rivets, because the shearing has run inside, and that plate should have been thrown out for that reason and never put into this tank.

Q. It has been suggested, Commander, that tanks constructed such as this tank was, by reason of its strengthening factors, referring particularly to the thickness of the plates, and the closeness of the riveting, was suitable for uses much more severe than the confining of gasoline. What in your opinion are the uses to which a tank constructed as this one was could be put?

A. Well, if this tank had been built with proper workmanship and properly caulked, then its general design would have made it satisfactory for either water or oil under moderate pressure, but without the caulking, which is absent here, if this tank had been put under pressure, either of water or of oil, and brought to anywhere near its designed working strength, as regards the thickness of

the plates and the size of the rivets, the tank would have leaked very badly because of poor riveting, because of lack of caulking, and might well have failed by the tearing of the plate at the point where it was improperly sheared.

Q. What can you say with respect to the way in which the riveted heads fit the plate on this sample 160?

A. The points, you mean?

Q. Yes.

A. It is a very poor riveting job. The edges of the rivets are cracked. The rivets are not uniform, they have not been hammered down into proper shape and contact with the plate, and I would say that they are both weak as rivet points, and very poor for tightness.

Q. There has been some suggestion that the condition of the rivets on these three exhibits we have been referring to, 157, 159 and 160, can be accounted for by corrosion during the period of a little more than four years since this fire took place. Bearing in mind the fact that the tanks had been in service on the yacht Seminole for some twelve or thirteen years prior to the date of the fire, can you tell us whether these conditions that you have called our attention to could be accounted for by corrosion or deterioration since 1935?

A. On sample 160, while there has been some moderate rusting on the rivet points, it is not very great, and it is very plainly evident that those rivets are practically in the condition that they came from the riveter's hammer, because these cracked edges have not been corroded away. Cracks are very sharp and very clear just as the riveter finished them, and on probably at least half a dozen rivets on sample 160, you can still see very clearly the lines and the marks left by the riveter's hammer as he worked around that rivet there, and that one at that point—these cracks—that crack there (indicating)—and they haven't rusted out of the heads of these rivets. I would say that this riveting job, in Exhibit 160, shows very poor work-

manship, and the rivets, except for moderate rusting, are practically in the condition that the riveter left them. On sample 157, the rivet points still show very clearly the edges of the riveting hammer die and are not badly rusted. On sample 159, the corrosion on the points is somewhat worse, one rivet point shows definite evidence of considerable corrosion, but the others moderate, and on the rivets there the cracks on the edges are still visible on at least one. The rivet heads inside the tanks on all three samples—on two samples—160 and 157—show moderate corrosion more than the rivet points. On sample 159, the corrosion on the rivet heads inside is not especially marked, those heads are still in fair shape.

Q. I would like to refer to Exhibit 158, which I can tell you is a section cut from the top of one of these tanks, the seam being the top seam, between the top of the side of the tank and the crown, and I call attention to one rivet which has been removed—said to have been removed by burning from the plate. Can you illustrate any of the points that you have made by reference to that rivet hole?

A. This exposed rivet hole on sample 158, which is a section of the joint between the crown or top of the tank and the side, shows that the hole in the crown and the hole in the side were improperly laid out when punched, and when assembled failed to line up truly by some one, between a sixteenth and an eighth of an inch. The holes show also that no reamer was ever run through these holes to true that up, and that consequently, when a rivet was driven in that hole, the point of the rivet and the head of the rivet failed to come concentrically, it would have been impossible for the rivet to have completely filled the hole, and it is an example of a violation of all the rules of riveting up and assembling tanks for containing liquids, and more particularly for containing gasoline, in that the holes were not properly laid out in the first

place, were not ever reamed truly afterwards before the rivet was driven, and are a good sample of the careless workmanship with which this tank was constructed.

Q. Can you tell us whether the seam inside or out on that exhibit has been caulked?

A. (Examining same.) The outside seam was never caulked, the inside seam was never caulked, the inside seam in addition shows a further example of careless workmanship, in that there is a piece of metal adjacent to the rivet which has been removed, where the shears ran off the true line and then were re-set to the true line and a new sheer line started. Neither the inside seam nor the outside seam were ever chipped, planed or caulked. In addition to that, the assembly of this particular sample indicates that the crown was not given a sufficiently long straight side for an overlap, so that the side sheet comes up on the crown after the crown has started to bend away at the knuckle radius, leaving a particularly wide open joint at the top and one that would have been practically impossible to have made tight on this assembly, even by caulking.

Q. Can you tell us, by examination of this Exhibit 158, whether the top seam—outside seam—was ever soldered?

A. The outside seam shows no sign of solder or of tinning either on the crown or on the side wrapper sheet, and there is a total absence of any solder in the joint between the two, where there would still be some if any solder had ever been run on that joint. There never was any solder there.

Q. It has been suggested, Commander, that that joint was soldered on the outside and that, due to high temperature to which the tank was subjected during the fire, that the solder was reduced to a powder which was afterwards removed by wind or some other force. Can you tell us whether in your opinion that is possible?

A. I think that is ridiculous. If there had ever been any powder in that joint, as it got hot and melted again,

it would have run deeper into the joint, and when the metal cooled off you couldn't have had any current of air sweeping through this joint to remove anything. The solder would have stayed in there a little deeper than it was originally put in, and in this opening, for instance, where the plates are a little more separated, when the rivet was knocked out you would see signs of solder that had melted and run down while this was exposed to heat, and there is no sign of solder there. That could never have happened.

Q. What do you see, if anything, as you look through that opening between the plates where the rivet was knocked out?

A. Well, there is very evident evidence of rusting between the crown sheet and the side, in what was originally the lap of the two plates. That is evident, both from the top and from the bottom, and that indicates that those plates were never in tight enough contact while the tank was in service to keep moisture out from under there, and that the moisture did get in between those two plates and rust it up, which is just what you would expect from this type of construction. You see rust in there but you can't see any solder.

Q. I call your attention to this Exhibit 6-A, which is a section cut from the bottom of this same tank, and call your attention to the riveting there, and ask you what you can point out to us with respect to the riveting?

A. The riveting on this joint exhibits very clearly again the poor and careless workmanship used in the construction of these tanks. The rivet which happens to be directly below the red dot after the "4" painted on the sample, has the point of the rivet on the outside badly off center from the head of the rivet on the inside, which shows conclusively that the holes in the outer plate and the inner plate were not truly lined up, and that the rivet was driven through an improper hole. In addition to that,

all of the rivets in this sample, and in particular the rivet just referred to, are very poorly driven rivet points, indicating that the metal, which once formed the points of these rivets, were only thin films spread out over the plate, which have since rusted practically completely away, exposing the holes beneath, and very definitely showing that the shanks of the rivets, as driven, never filled the holes in the plates in which they were driven. It is a good sample of the type of work which would have been rejected immediately by any competent inspector for a gasoline tank.

Q. Assuming that, as originally driven, these rivet points did spread out, as you said, in a thin film, would that in your opinion form a proper protection against seepage of gasoline?

A. No, these holes should have been countersunk holes to get proper tightness to hold gasoline, and the rivets should have been countersunk rivets, filing a countersink with solid metal through the thickness of the outer plate. What actually was the case in this job was that a thin film of metal was spread over part of the hole, which has corroded away at some time in the past, and exposed the hole, showing that the hole was neither countersunk nor ever filled by the straight side of the rivet, and is completely unsuitable for gasoline.

Q. Bearing in mind that this tank had been in service for twelve or thirteen years prior to 1935, and since 1935 has been subjected to the elements, can you tell us in your opinion whether the conditions there shown can be accounted for by corrosion since 1935?

A. The amount of corrosion indicated on this sample, Exhibit 6-A, must have extended over a very long number of years, and I would say that it is not very probable that the sample was perfect up to 1935, and since 1935 developed the corrosion shown. It was probably progressive throughout the life of the tank.

Q. Is there any evidence of solder on this Exhibit 6-A?

A. Yes, the lower seam of sample 6-A was once soldered and still shows a very considerable amount of solder left.

Q. How about the rivets?

A. There is no evidence whatever of any solder ever having been on the rivet heads or the rivet points.

Q. Is there any evidence of caulking on the Exhibit 6-A?

A. The ends of the inner plate on Exhibit 6-A, which would be the plate that would be caulked against the outer plates, show no signs of ever having been caulked. The seam is simply overlaid with some solder, most of which is still here. It shows good adherence in some spots and poor adherence, or no adherence, in at least one other spot.

Q. Which is the spot where you called attention to where there is no adherence?

A. There is no tinning at that point, the solder evidently never stuck to the outer plate.

Q. Just so we will be clear, when we come to examine the record: You are holding this exhibit—

A. On the side toward the "A" of Exhibit 6-A—it is on this side, and just outboard of the outer rivet on that side—that is the last rivet there—right there, for instance—no tinning (indicating).

Q. You have held this exhibit with the "6-A" down?

A. Yes, and with the "A" to my left as I look at it.

Q. And it is at the lefthand edge of the seam that you call attention to the fact that there is no tinning on the outer plate of the tank, is that it?

A. That is right.

Q. Now, I call your attention to Exhibit 5-X, and ask you if that section has ever been caulked?

A. The edges of the inner plate of sample 5-X show clearly that they have never been caulked.

Q. And is there any solder on the rivets—has there been?

A. No, the rivets on 5-X were never soldered. They are not quite so badly rusted outside as on Exhibit 6-A, but one of them is nearly as bad. One rivet on Exhibit 5-X also shows a moderate eccentricity between the rivet point and the rivet head, but not as bad as on Exhibit 6-A.

Q. I call your attention to Exhibit 5-Z, and ask you about the caulking and about the soldering.

A. The exposed plate edges of the inner plate on Exhibit 5-Z, both of which are clearly exposed, show no sign that the plate was ever caulked. The joint is, as in the last sample, however, soldered.

Q. Any evidence of solder on the rivets?

A. No, the rivets show no signs of ever having been soldered, either inside or outside.

Q. Now, referring to Exhibit 5-Y, I will ask you the same questions with respect to Exhibit 5-Y.

A. Both edges of sample 5-Y, which I have just exposed by scraping away the soldering, show no evidence that a caulking tool was ever applied to them. This happens to be the most heavily soldered joint of any of the bottom joints that I have seen here, and the rivets in this case show no signs of having been soldered, either on the heads or the points. Here is a particularly good example, on 5-Y, of what I was talking about—of a thin feather of iron having been knocked down from the rivet point, and I won't break it off, I have bent it up a little bit—on the second rivet from the right side, and it hasn't yet corroded away. It is a thin film of metal that was smashed down against the plate—that would further indicate a very poor type of riveting.

Q. That is directly under the red mark?

A. That is directly under the figure 1 on the outside. No decent riveter would ever finish off a rivet like that.

Q. Any evidence of solder on the rivets on this sample?

A. No, on the rivets on sample 5-Y there is no evidence of solder either on the heads or the points of the rivets.

Q. What in your opinion, Commander Ellsberg, would be the effectiveness of solder on tanks constructed such as these, in making a tight joint, in respect to gasoline?

A. In my own work and observation on tanks for carrying oil, the use of solder as a caulking material on a tank of this nature would never be allowed. It is the poorest material that could be used for the purpose, even as a makeshift, because this tank having been constructed, in order to get good adherence of the solder it would be necessary to clean the surfaces thoroughly, chemically, exposing the bared metal on the sheared edges, and the clean galvanized metal on the flat edges, and then it would be necessary to tin those surfaces by running a solder iron back and forth under a fair degree of heat in order to get the solder to stick, and on the completed tank that would be a very difficult thing to assure, that ordinarily any person building or working on a steel tank which was not caulked and which he had to make tight, in spite of that, would normally use welding, either electric or acetylene, to weld the two edges together with a steel welding rod, but solder would never be used by any competent workman or shop for such a purpose, because it would be very difficult to get a job that would come near being tight, and there is the further hazard, in connection with the gasoline tank, that if a fire ever occurred for any reason at all in the neighborhood of that tank, that the solder that melts at a lower temperature of around 400 degrees, would melt out of the joint, re-open the leaks which had once been plugged with solder, and start to spill the inflammable gasoline on the fire. It would never be used by a proper shop or workman for that purpose, and never be passed by a competent inspector for that purpose.

Q. What would be the effectiveness of soldering the bottom seam, as appears on Exhibit 5-X, without soldering the rivets?

A. For gasoline, even if you made a perfect joint with the solder on the seam, you would still have the possibility on any tank, and on this tank the certainty, of leaks around the rivets, because the rivets being poorly driven, through improperly lined-up holes, without being counter-sunk, and with poor type of point, would be bound to leak gasoline through the rivets, and would give you weeps and seeps of gasoline on the outside of the tank, which would vaporize, even though the joint itself had been made tight by solder.

Q. And would that be true of the side seams as well?

A. Yes, the same would be true of the side seams, which would, where they are not soldered—would leak because of the lack of caulking, and, both where they are soldered and where they are not soldered, would certainly leak through the rivets which are about as poor in the side seams as they are in the top and bottom seams.

Q. Is a drift sometimes used for lining up rivet holes in plating such as this?

A. It is, but it is prohibitive where good workmanship is required. That is, two holes which do not line up, may be distorted to a sufficient extent to get a rivet through by driving a tapered pin or a drift through, which further deforms the metal, but does not give you a fair hole. A drift can be used, and looking at this particular hole it appears that a drift probably was driven through that to expand the hole and allow the rivet to come through.

Q. You are looking now at the exposed rivet hole in Exhibit 158?

A. Yes. That is strictly prohibitive where you are trying to get good oil-tight or good water-tight work. The hole has to be reamed fair, and if necessary an oversize rivet driven to fill the hole.

Q. You have seen these samples—the exhibits we have discussed here—157, 158, 159, 160, 5-X, 5-Y and 5-Z, which I have told you are sections taken from tanks which were used on the yacht Seminole for the storage of gasoline supply for main engines, what is your opinion, from the workmanship as you have observed it on these tanks, is the suitability of a tank so constructed for that purpose?

A. These tanks are improperly built and constructed for that purpose, and the make-shift job of soldering part of the seams, which was done, did not make them suitable for the purpose and it was hazardous and unsafe ever to have installed them for the storage of gasoline on that yacht or on any vessel or in any location, whether aboard a ship or not.

Q. I call your attention to this exhibit 117, which consists of portions of two rivets, one of which was driven from this hole, Exhibit 158, and another from another rivet hole in one of the tanks, and ask you to examine them and tell us what you observe with respect to them.

A. Well, they indicate that they were not driven in faired and true holes, that in one rivet the hole in one plate toward the point was decidedly larger than the hole in the other plate, and the rivet has bulged here and there, due to that lack of fairness. The other rivet very definitely indicates that it was driven in an offset hole where the two plates did not properly line up, and the rivet was bent over in an endeavor to get it through, and then pointed up. Neither one of these rivets indicate that the holes in which they were driven were ever properly faired or reamed for rivets, nor does it appear that they could truly and fully have filled the holes in which they were driven. Also by the looks of them, I would judge they were probably cold-driven rivets.

Recess taken at 2 P. M.

4675

After Recess, 2 P. M.

Present at before.

EDWARD ELLSBERG resumes the stand.

Cross Examination by Mr. Underwood:

Q. Commander Ellsberg, you resigned from the Navy in 1926?

A. Yes, December 1926.

Q. And since that time you have been with the Tidewater for nine years?

A. Yes, until 1935.

Q. What was your job there?

A. Chief engineer.

Q. In charge of what?

A. Both the design and the mechanical erection, construction and maintenance of the physical plant for refining petroleum and any other problems that came in in connection with pipe lines or tankers.

Q. Have you had anything to do with the construction of any ships for Tidewater in that interval?

A. Tidewater built several ships, but I had just a casual supervisory interest in the plans, they were planned by shipyards like Sun, Bucey & Jones, so I had no supervision over the constructing of those ships for Tidewater.

Q. So your work was in connection with shore tanks?

A. Since 1926, with shore tanks.

Q. For Tidewater, I speak of?

A. Yes, for Tidewater.

Q. And since you left Tidewater, I think you said your work has been mainly in the field of petroleum engineering?

A. That is right.

Q. What does that mean—some sort of work you did for Tidewater?

A. Yes, it is design work, survey work in connection with existing refineries, and the last job which was about two months ago, was an examination of a number of oil tanks in a refinery in Pennsylvania.

Q. Crude oil tanks?

A. Both crude oil, lubricating oil and gasoline tanks—they were all involved.

Q. Then you really haven't had anything to do with tanks on vessels since you resigned from the Navy, have you?

A. Well, on the S4 job which came about two years after I resigned, we had some tank problems there, and on some of Tidewater's tankers, which we had to operate after they were built. I had a fair amount to do with maintenance problems on those tanks—they were tankers.

Q. They were bulk oil tanks in a tank steamer?

A. Bulk oil tanks in a tank steamer. They had some small tanks for lubricating oil—yes, you are quite correct there, yes, that is right.

Q. Did I understand you to say that you were the superintendent of the New York Navy Yard?

A. No, you didn't.

Q. You were superintendent of something at the Navy Yard, was that it?

A. Yes, I was the outside superintendent, in charge of construction of several ships.

Q. You said four large ships?

A. One large ship at New York and three large ships at Boston.

Q. What type ships?

A. The ships at Boston were oil tankers.

Q. And at New York?

A. That was a battleship in which the major job we had in the hull was a very extended system of oil tanks, she burned oil—that was the most complicated structural job we had.

Q. Fuel oil tanks?

A. Yes.

Q. Double bottom tanks?

A. No, sides.

Q. Wing tanks?

A. She carried her tanks in a cellular at the sides.

Q. Something similar to a double bottom, only in the sides?

A. Well, it was vertical instead of being horizontal.

Q. Have you ever designed any cylindrical tanks to contain gasoline?

A. Yes, large numbers.

Q. How long ago?

A. The last design work I did on that was about 1935.

Q. How big tanks?

A. They would run in size from about thirty inches in diameter and five or six feet high, through tanks about four feet to six feet in diameter, and six to eight feet high, and those were for receiving tanks for gasoline in connection with various refining processes.

Q. Were used in the refineries?

A. Yes, they were for use in refineries for holding gasoline, and then, I would say, several hundred from those sizes up to 80,000 barrel tanks. In other words, my tank experience for gasoline has been, I think, rather wide, and I have had to design and build, and then afterwards take care of it in operation, gasoline tanks from small vertical cylindrical tanks up to large field tanks.

Q. But not in connection with vessels?

A. No, those were ashore. I may add there, that naturally it is more difficult to keep a tank aboard a ship than it is ashore.

Q. Why do you add that, Commander?

A. Because, you see on a vessel—

Q. I don't mean why is it so, but why do you say that—I didn't ask you that.

A. You were making a distinction between a ship and a shore tank, and I was trying to point out what the distinction is there.

Q. You didn't think I asked you which was more difficult to keep tight, did you?

A. Well, I assumed you asked a question with respect to the difference between ship tanks and shore tanks for some particular purpose, and since that is the difference I was glad to inform you—perhaps you know.

Q. You didn't under and me to ask you about that though, did you?

A. No.

Q. You volunteered that, didn't you?

A. Yes, that was volunteered.

Q. You don't suggest that a caulking tool of this size, Exhibit 163, could be used to caulk a 3/16 inch plate, do you?

A. Yes, I do, that is a satisfactory tool for a 3/16 inch plate.

Q. Do you know how wide the point of that tool is?

A. It is a little more than an eighth of an inch—practically an eighth of an inch, yes.

Q. Compare an eighth with the width of Exhibit 164.

A. That is perfectly all right. What is the matter with it?

Q. I am asking you.

A. There is nothing the matter with it.

Q. You say that that tool could be used to do this caulking on Exhibit 164?

A. Yes.

Q. Have you ever done any caulking yourself?

A. Yes.

Q. How long since?

A. Oh, probably my own caulking, except for making good minor leaks, is—oh, fifteen years ago.

Q. How much of it have you done?

A. I never claimed to be an expert caulker—I told you in connection with learning the job—a moderate amount, so that I learned how to use caulking tools, riveting, drills and other tools. I am sorry if I have given you an impression that I am a mechanic, then I would like to correct it.

Q. You don't need to be on the defensive, just answer my questions and we will get through a lot quicker.

A. All right.

Q. Where did you do any caulking?

A. At both the New York Yards and the Boston Navy Yard.

Q. While you were superintendent in charge of construction work there?

A. No, that was as a student. The only work I ever did as superintendent there was occasionally to take some tools and rectify a minor defect which had to be done right away, and I would do that.

Q. Or perhaps to show a man how to do it?

A. No, I would never attempt to show a caulker how to do a caulking job, because the chances are most of the caulkers were far better caulkers than I.

Q. The caulking process that you have described, is that the only caulking process with which you are familiar, I refer, of course, to caulking steel plates.

A. There are variations in the tools used, but that is a standard and normal process of caulking steel plates and tanks, and it is the one with which I am familiar, yes.

Q. Is that the only one with which you are familiar?

A. Unless you include welding.

Q. No, my questions aren't trick questions. When I say caulking, I mean caulking.

A. That is correct, yes.

Q. I am not sure whether I correctly understood your testimony about Exhibit 164. Part of this seam you say has been caulked where it shows a decided depression?

A. Yes, that is right.

Q. What did you say had been done to the balance of that seam?

A. This has evidently been planed to give you a smooth surface for the final caulking.

Q. Has anything else been done to it?

A. Evidently not. It might have been chipped, but this plate seems to have been planed.

Q. Are chipping and planing alternative processes for achieving the same result?

A. Yes. Did I make myself clear as to why you chip and plane? If not I would be glad to do it now.

Q. In your description of the caulking process, have you been describing caulking by means of a power tool only?

A. No, it can be done either by hand tools or power tools. The ordinary power tool is an air tool and of course the hand tool is operated by your muscles.

Q. So that what you have told us about the method of caulking would be equally applicable to hand tool and power tool, is that correct?

A. Practically. You can usually get a little more finished job with the power tool, but you can do a very nice job with hand tools.

Q. Would you say that Exhibit 164 was caulked with a power tool or a hand tool?

A. That looks to me like a power tool job.

Q. Commander, you have made various comments on these pieces of tank which you have examined here this morning. I would like to get clear one thing: Do you say that they necessarily leak because of these things which you pointed out as defects, or that they would be likely to leak or what?

A. Well, the answer to that is that an uncaulked tank of this construction could not be tight, containing gasoline, this tank as built as shown by these samples here.

Q. I want to be clear about your testimony on that: Assuming that these tanks were not caulked—as you say

they were not—is it your testimony that they necessarily leaked?

A. Yes, they would have to leak with gasoline in them.

Q. And that would be true from the day they were built, assuming gasoline was put in them that day?

A. If these tanks, when they had first been built, and never had water in them—from the day they were built had gasoline in them—they would have leaked.

Q. Assuming these tanks were put in the Seminole in 1922, and were used for carrying gasoline from 1922 to 1935, the tanks leaked for a period of thirteen years, didn't they?

A. If those tanks had come from the shop without any rusting to plug the holes up at all and had been put in the Seminole as they physically stand today, they would have wept gasoline from seams and rivets from the day they had been put in.

Q. Began right away?

A. Yes, if they had been new tanks and built the way they are.

Q. Where would those leaks have been?

A. You would have had weeps along these open seams—

Q. What do you mean by open seams?

A. You see that seam there (indicating)?

Q. I am asking you—just say it on the record.

A. The seam as shown on sample 158.

Q. Of course, you wouldn't get any leak there, that being the top seam, unless the gasoline was up there?

A. You would have to have the gasoline level above this point, then we would have leaks. Now, taking—I assume you are talking about this soldering having been on the day the tanks went in as new tanks?

Q. Let's just consider the side seams for the moment, which you say were not soldered—assuming the tanks were full of gasoline, would they leak along the seam?

A. Yes, the seam would have shown leaks, weeps—not necessarily all along it, but here and there along that seam, and various of the rivets would have shown weeps.

Q. Well, which rivets?

A. Those rivets there where the metal it not down here on the plate would have shown weeps—160.

Q. Counting from the righthand end of Exhibit 160, the righthand end when 160 is right side up, tell me the numbers of the rivets which would leak?

A. I wouldn't assume to do that, because I can tell you this: Nobody can look through each one of those rivets and say that that specific rivet—looking at the point—is going to leak. I can tell you this: That the first five rivets over the figures "160" are poorly driven points and would have probably leaked.

Q. I want to get this straight: I understand you tell me that tanks built like this, will leak from the very day they are built, being filled with gasoline that day?

A. That is right.

Q. I want you to tell me just where they would leak, on those samples—take 160 first, and tell me which rivets would leak that day?

A. I am not God, and can't tell you that. I can tell you, having seen some of these holes that were cut out—looked at those seams and judged the character of the riveting—that it is absolutely certain if this tank when new, would have been filled with gasoline, would have had weeps from the seams and weeps from some of the rivets. I have tested very many tanks, of which the workmanship is far better than this, and I have never found a tank yet that, when it was first filled up with gasoline, and tested after having been built, didn't show leaks on some rivets or some of the joints, that did not have to be re-caulked, and this job is evidently, in workmanship, so much worse than any tank I have ever seen built for gasoline, that I am sure there would have been far more leaks in both rivets and in seams.

Q. Can you point out any rivet that you say actually leaked from the day that tank was put into use as a gasoline tank?

A. I wasn't there, how can I say that?

Q. Well, isn't that what you have said, Commander?

A. No, I have said—

Q. Haven't you told me those tanks leaked from the day they were put in use?

A. I would say if those tanks were filled with gasoline when brand new, and without a lot of rust in them from previous water use to plug up the openings in the seams and around this poor riveting, in the absence of all that filling material which would gradually wash out in the presence of gasoline, if originally present, that the riveting on those tanks is so poor, and that the uncaulked seams are so evidently uncaulked, that without any question you would have weeps around rivets and seams. Now, I can't tell and say specifically that a given rivet will leak, but looking over some of these, some place here, you can take a rivet like that, which I discussed a while before (6-A) the rivet that is under the red dot at the right of the "4", that rivet very evidently does not fill the hole, and that the gasoline would get to that rivet from the inside, and you would probably get a leak at that rivet—that is the worst sample here.

Q. Well, talking about that: Do you say that the gasoline would get to that rivet hole?

A. It would, with the exception of the rust filler inside.

Q. Do you say that the plates around that hole are not sufficiently tight together to keep the gasoline away from the hole?

A. You can't lay two plates together and drive them up with riveting of this sort, especially on a circular surface, and get them so close as to get a tight joint for gasoline without caulking.

Q. You don't think that is possible?

A. I have seen too many tanks—I would say it is not possible. It would be possible in just this case: If those were machined joints—if those were turned to a true machine fit—which it never was—and this thing (indicating two contact faces of the plate), the outer plate turned also to a true machine fit, and those two surfaces then fitted together as machined surfaces, it would be possible, not otherwise.

Q. So that it is your testimony that these tanks installed in the Seminole in 1922, assuming that they had not previously been used for something else, immediately began to leak?

A. It is my testimony that they would immediately show weeps.

Q. And continue to show weeps—

A. Evidently they did it, because there is physical evidence here that in an attempt to rectify the weeps and leaks they had, they went to the make-shift of soldering up some of the worst seams that were evidently leaking.

Q. You conclude, merely from the fact that solder is present on some parts of these tanks, that they leaked from those parts?

A. Yes, I would say that in an attempt to cure the leaks they went to this make-shift of soldering some of those joints.

Q. Would you say there was no leak in the side seam above the point where the solder stops?

A. At that time I assume that the rust there stopped those leaks.

Q. You are assuming now there was rust there?

A. Yes, that is what I am assuming. I can see the rust, as a matter of fact, in one of these open joints right here (indicating on Exhibit 158).

Q. So that you want the Judge in this case to believe, assuming these tanks were never used for anything previously to gasoline, that they immediately began to seep or weep gasoline when installed in 1922, and did so

continuously thereafter for a period of thirteen years, is that right?

A. The first question is your assumption—that is, you make an assumption that these tanks were put in the vessel brand new without ever having been used for anything else—do I ask if you assume that?

Q. I am assuming that.

A. All right, if one takes that assumption that these tanks had never been used for the storage of water or anything else up to the day they were put in the ship, just as they came from the shop, it is certain that these tanks would all weep gasoline.

Q. And continue to do so during all the time they held gasoline?

A. Still on the assumption—except to the extent that they may have got in and tried to wipe solder in it or something else.

Q. Let's assume they were used for some purpose, say for the holding of water, before they were installed in the Seminole, that, you say, would cause a condition of rust to exist in the joints which might stop leakage of gasoline for a time?

A. As long as water was being used in there—that is common experience, and it is my experience.

Q. I am asking to assume now that these tanks were used for holding water for some undeterminate time, and then they were put into the Seminole for the purpose of holding gasoline, do I understand that it is your testimony that they wouldn't begin to leak right away?

A. Very probably not.

Q. How soon would they begin to leak?

A. If I had seen the tanks at that time I would be in a better position to tell you, I cannot state at this time.

Q. Any opinion on that at all?

A. It would depend on how badly they were rusted, and how good a rust job had been done in sealing up these crevices between the seams and around poor rivets.

Q. There is evidence in this case, I think, that shows those tanks were installed in 1922. On that assumption would they begin to leak by 1935 if they had been used for water previously and were rusted inside?

A. They would probably leak before that.

Q. Well, when?

A. You might get some weeps after you had had gasoline in them a few weeks. Some other place might not start to weep for several years. There might be some places in the tank where the metal fortuitously happened to be hammered together tightly, where you would never get a leak, but having used tanks of this general size for gasoline, I can say that within some period—that might be from a few weeks to a few years—in different parts of the tanks they would get leaks in all four of these tanks from gasoline seeping through some of these tanks.

Q. Then whether they were used for water or not prior to their installation in the Seminole, and there used for gasoline, these tanks in your opinion leaked either from the outset or within a few weeks thereafter, is that right?

A. There would be some leaks probably within a few weeks, and the case would tend to get worse as the tank got older and gasoline kept in them for a longer period.

Q. So that in either event, these tanks were leaking no later than, we will say, 1925, is that right?

A. I would say, looking at these tanks, that you had some weeps in them probably by 1925, yes.

Q. And that is not a process that would stop by its own volition, is it?

A. No, unless some work was done on it, would either stay at bad as it is or ultimately get worse.

Q. Gasoline itself wouldn't plug up the leaks by any corrosive action or anything of that sort?

A. No.

Q. So, if leaking in 1925, and nothing done in the interim—

A. Why do you say 1925?

Q. Do you want to pick any better date?

A. No, I was curious. You have mentioned 1925 several times. I am not particular as to any year.

Q. You said if the tanks were used for water previously, you would have some leaks through the rust within a period of a few weeks?

A. That is probable, yes.

Q. Since these tanks were installed in 1922, 1925 is three years later, and therefore more than three weeks—more than a few weeks?

A. Yes, you would have some weeps.

Q. So that by 1925, you would have some leaks in these tanks, whether they had been previously used for something else or not?

A. Very probable.

Q. And that is not a process that would stop by itself?

A. No.

Q. It could only be stopped by some act of man?

A. Yes.

Q. Have you ever had any experience in the construction of vessels elsewhere than in Boston and New York Navy Yards?

A. You mean actually supervising the construction of them myself?

Q. Yes.

A. Not as a supervisor. I have had occasion to observe the construction of vessels in other yards.

Q. Where, for example?

A. The New York Shipyard at Camden, and the Newport News yard at Newport News, the Sun Yard—

Q. At Chester, Pennsylvania?

A. Yes, in Pennsylvania, and I have had repair work, of course, on vessels that were built in German yards, in English yards and in American yards.

Q. Commander, the ordinary naval vessel doesn't have tanks of this type to hold gasoline, does it?

A. Somewhat larger, yes.

Q. Cylindrical tanks?

A. Yes.

Q. What type of vessel has such tanks?

A. Well, you take a ship like the ordinary cruiser, will carry some gasoline for its motorboats, and they have tanks—cylindrical tanks—in them to carry gasoline. A large ship like an aircraft carrier, that has to have a huge volume of gasoline for a lot of planes, will have some structural tanks built in below, but naval vessels have had cylindrical tanks put in for carrying gasoline.

Q. You mean such vessels as battle cruisers?

A. Well, I said cruisers, they are more numerous. We have no battle cruisers, so naturally we have no gasoline tanks in battle cruisers.

Q. That is for use in airplane motors?

A. Usually in the motorboats, and on ships that only have one or two planes they may use it for planes, but the average service is for these ship's motorboats. I think I made it clear, if I didn't I will reiterate it—that ships like aircraft carriers have built-in gasoline tanks.

Q. Have you ever seen any tanks—gasoline tanks—the seams of which were soldered?

A. Never, except, if you mean these five-gallon tins—that I wouldn't call a tank, no, but as a regular tank of any size above 100 gallons, I never have.

Q. Of course, those little ones you speak of are made of sheet metal, and not plates?

A. Yes, they are made of tin sheet iron, those have soldered sheets, they are covered with tin.

Q. Commander, you have been asked to assume that those tanks went through a fire?

A. Yes.

Q. Before the pieces that you have before you were cut out?

A. Yes.

Q. Just what kind of a fire have you visualized in making that assumption?

A. What kind of a fire I have assumed?

Q. Yes. You have been asked to assume they went through a fire—what kind of a fire have you assumed?

A. The information that was given me was that this yacht had a fire after an explosion, and that a shed and other yachts burned up. I made no assumption about the fire other than what I can see from the visible evidence of these tanks, and from the visible evidence of these tanks, the evidence is that the fire around the tanks directly should not have been a very serious or a very long continued blaze. The tanks themselves don't show it. There may have been—I made no assumptions about a fire at all, except I was told there was a fire there.

Q. Well, have you assumed that it was or was not a fire of great heat or of great length in the vicinity of these tanks?

A. The evidence within the vicinity of the tanks is that the fire was not severe. I have seen fires involving oil tanks and oil storages and I have seen tanks, both small and large, that have been through such fires.

Q. By such fires, what do you mean?

A. What I would call a severe petroleum fire, and without exception the tanks in those cases, the metal has been badly wrinkled and buckled. All I can assume here, for instance, from the evidence, is that the bottom of these tanks and down near the lower edge, there could have hardly been any fire to talk about, because it hasn't even melted out the solder, and the solder would melt at a temperature of around 400 degrees Fahrenheit, or a little more, which is not a very high heat in any fire, and that even if the tops of the tanks had been exposed to a severe blaze, that is one that would tend to distort and buckle the metal, the heat would have traveled down the metal sides more or less towards the bottom, and would certainly, by conduction through the tank's sides, would apparently have conducted the heat down the steel sides.

of the tanks toward the lower end and have melted out the solder there, which it did not do.

Q. Of course, you don't know whether the conditions at the top of the tank are any different than the conditions at the bottom or not, do you?

A. Not having seen the fire, I can't say, I can only say that the bottom did not have any appearance of heat, because the solder it not melted out, and the evidence of the top sample, Exhibit 158, shows, of course, the effect of flame where the acetylene torch cut this sample out, but there is no particular evidence of distortion due to high heat on the rest of the metal.

Q. Run your eye along that seam—do you see that distortion?

A. There was a rivet driven out of there.

Q. Well, there is distortion there?

A. Yes. This is not a true line there, but evidently—and you can see that very plainly, both inside as well as outside—there has been used considerable force—used at that point to knock a rivet out, with the effect it has distorted the inside plate and has evidently penetrated the outside plate.

Q. You consider that distortion due to the driving out of the rivet?

A. It is absolutely certain that the distortion on the inner plate is due to the driving out of the rivet which was driven inward, and the distortion on the outer plate is also in the same direction, an evident result of the same force that was used to drive out the rivet. If you can show me some photographs of this tank after the fire, whole—before cutting off—I might be able to pass on the question of this distortion a little better.

Q. Did I understand you to say correctly that in your opinion the rivets on this piece of tank, which you have seen, are practically the same condition as when they were driven?

A. No. Referring to one or two samples I made that statement, but I did not make that statement as applying generally to all rivets. It is very evident that on sample 6-A, for instance, the rivets have been corroded to such a degree that that is not the state in which they were left when they were first driven.

Q. Look at Exhibit 160 for example.

A. The rivet points on 160 are practically in the same condition in which they were left when they were driven. They show the cracks and the hammer marks of the riveting hammer, and those have not been corroded away. On the inside of the tank, the rivet heads are more corroded than the rivet points outside, and show very decided pitting.

Q. Referring to Exhibit 160, these cracks in the rivet points, what is your criticism of those cracks?

A. That that shows an unskilled riveter who drove them up, and that furthermore they were probably driven up cold. In other words, no skilled riveter will drive a rivet like that flattened out, with the fin left beyond the line at which he is trying to make his point, and with the metal spread so much that it cracks that way (indicating a crack a little to the right of the red letter "A").

Q. Indicating the sixth rivet from the right when the red letters "2A" are right side up?

A. That is right.

Q. Do you say that crack would leak?

A. I say that is a sign of a poorly driven rivet. The one next to it is as bad or worse.

Q. Do you know how big those tanks were?

A. Just from looking at them, I have some idea of the diameter. I have been told they are about forty-two inches in diameter and about seven feet high.

Q. At what temperature does solder melt, did you say?

A. There are different compositions, but solder will melt at about 400 to 450 degrees Fahrenheit, for those

that are normally in use. You have solders that will melt a little below 400, and some that will run up towards the 500 line—all temperatures Fahrenheit.

Q. What is the melting point of zinc, do you know?

A. Around close to 700 degrees Fahrenheit—a little on the low side, I think, but in that general vicinity.

Q. I take it that rusting is a more rapid process when metal is exposed alternately to air and water, than it is otherwise, is the correct?

A. What are the otherwise conditions?

Q. When it is exposed only to air or only to water.

A. The most rapid rusting comes on a steel object which is continuously moistened and at the same time continually exposed to air. An object which is exposed to ordinary air only, without physically being wet, will rust very much slower than one which is continuously or alternately wet. An object which is completely submerged below water and not exposed to air, will rust very much more slowly than one just exposed to air alone.

Q. You said something about Exhibit 6-A—something about the absence of solder at the lefthand end when you held the tank upside down, so to speak. Take your knife and scrape some more there, will you?

(Witness does as requested).

Q. What do you see now?

A. I see more bright metal than I saw before, but I still see some spots in there that show no signs of any tinning at all, and with a magnifying glass I could give you a better opinion, but I think I scraped that spot hard enough to scrape down to the bright steel. The other spots scraped easily to a bright finish from the lead or the tinning, but this spot, after considerable hard scraping, feels to me, from the way the point of the knife acts, that I am simply scraping bare iron.

Q. And do you express the opinion, from the appearance of Exhibit 6-A at that point, that the solder never formed a bond at that place?

A. Yes, that was my opinion before, and it still is.

Q. You have never done any designing or construction of yachts, have you?

A. Not of this type. I have had work on the construction of small boats in the Navy that were motorboats, but they wouldn't class as yachts.

Q. And your repair work has been limited to vessels of the Navy, and tankers?

A. No, I have repaired practically every type of ship that is built, including yachts.

Q. What type of repairs have you done to yachts?

A. Why, when you had to repair bulkheads, repair sides, handle repairs of piping and machinery. You see I can make that clear by saying this: During the World War, the United States commandeered pretty near every yacht in the country, of all kinds, big and small, and they came into the repair yard where I was working on repairs, by the dozens, and I have had every kind of repair work on yacht hulls that is required to keep them afloat, except repairs to fine furniture and upholstery and things of that nature with which we never bothered.

Q. You haven't had any yacht experience since that time?

A. I own a small sailboat myself, but I wouldn't class that as a yacht of this nature.

Q. So your answer to my question was no? (Repeated) You haven't had any yacht experience since that time?

A. No. Since that time, since the end of the World War, I have had no experience in yacht repairs, that is true.

Q. What was your job at the Navy Yard in those days?

A. The New York yard?

Q. Yes, at the time you speak of when the yachts were being repaired.

A. I was assistant outside superintendent on repair work for something like over a year, and during that time I had these vessels that we are talking about, and from then on, for about a year and a half—between a year and a year and a half—I had charge of the construction of a new ship, I was outside superintending construction on that job, that was at the New York Navy Yard.

Re-Direct Examination by Mr. Matteson:

Q. Did you tell us the temperature necessary to cut plates such as these that have been cut from the tanks?

A. Yes. The metal it heated up to a temperature of around 3000 degrees Fahrenheit, at which point it takes fire and burns with the oxygen. You have a temperature of about that nature along these burned edges.

Q. There was one other thing I think you said. You were speaking of the possibility of making one of these rounded sections from the bottom or top of the tank tight by having a machined fit between the plates. In your opinion, was there such a fit between the plates on any of these exhibits?

A. There is no evidence of that in these. There is very decided evidence it is not so by the way the lines are—there is one that has a certain bad shearing edge. These were never machined and I may add that that is not done in the normal construction of tanks of this kind anyway.

Q. Commander, you said that you might be able to give us a better idea of the extent to which the tanks were distorted by the fire, if you could see a photograph that showed more of a length of a tank. I show you this exhibit, Libelants' Exhibit 139, which shows a substantial section of the side of one of these tanks after it had been removed from the wreck. What can you tell us after examining that, with respect, to—

A. This only shows part of a tank. I hoped you might have a photograph showing the entire tank, but all this

photograph shows is that the section of the tank shown in this picture shows no particular sign of any distortion. The sides are still straight, the bottom seems to have its normal curvature, and you can't see any buckling or bulges in the thing, so I would say that picture might just as well have been taken of the tank when about new. it doesn't show any sign of distortion there. Here is another picture, marked Libelants' Exhibit 141—this is the next best picture I can see. That tank, as shown in Libelants' Exhibit 141, indicates that the sides of the tank are still a true cylinder, and that the bottom of the tank, which is visible in the photograph, still appears to be a true circle, so that in this picture there is no evidence of a distortion of the tank due to heat or other means.

Q. I call your attention to Exhibit 152, in which the tank was lying on the ground, and the picture taken from an end view.

A. That is looking from the top of the tank down the tank along one side?

Q. Yes.

A. And this also shows the side of the tank to be still straight and still a cylinder, and the top of the tank still to be a circle. It also indicates the fact that, as is shown by sample 158, that this tank is improperly constructed, in that the sides rise up above the curvature of the top head and that the top edge is not in close metallic contact with the top head as it should be, and that is very apparent that the metal is not in the close contact that good workmanship requires.

Q. I show you this exhibit, 5-L, which is a photograph looking down into the tank compartment, showing the sides of Nos. 1 and 2 tanks before they were removed from the vessel. Does that add anything with respect to distortion?

A. The sides of No. 1 tank and No. 2 tank, as shown in this photograph, are still straight, and indicate no signs of bulging or distortion.

Re-Cross Examination by Mr. Underwood:

Q. Have you seen other tanks that have been through gasoline fires—oil fires?

A. Yes, quite a number—this is in refinery service.

Q. Do I understand that tanks that are exposed to such fires don't look like these?

A. A tank that has been through a real fire, and exposed to high heat, is always wrinkled and buckled and distorted, I have seen quite a number. I have been unfortunately present at a number of refinery fires, due to gasoline and some due to other oils, and I have had good opportunity for observing.

Q. Do you know at what temperature gasoline burns?

A. What temperature gasoline burns?

Q. I mean how high a temperature it gets to when liquid gasoline burns—how hot a fire you get?

A. Something depends on the conditions of the proper mixture of air, but if you were to burn gasoline in air under fair conditions, you would get a temperature that would, in the flame, run around 2500 or 3000 degrees or even higher, but you don't need that temperature on steel, steel will start to get a dull red at around 900 to 1000, and brighter red at around 1200 or 1300, and under these conditions, if the steel is heated up to a point beyond its redness point, and sometimes even when heated below that, you will get bulging and distortion.

Q. Do I understand it is your opinion that these tanks were not exposed to such a fire?

A. All I can say, looking at these samples and pictures, there is no evidence that they were exposed to such conditions. It appears from some of the photographs that they were shielded by a steel bulkhead on each side of them, which may well have been a factor in that situation, but the tanks themselves certainly don't show it.

4705 RONALD R. NELSON, being duly sworn and examined as a witness for the libelants, testified as follows:

By Mr. Matteson:

Q. Mr. Nelson, what is your business?

A. Shipbuilding — not shipbuilding — drydocking and ship repairing — Marine Basin Company, President of the Marine Basin Company.

Q. You are President of the Marine Basin Company at the present time?

A. That is correct.

Q. How long have you been President?

A. Since June 1934.

Q. How long have you been connected with that Company?

A. Since January 1, 1929.

Q. Will you describe to us the operations of that Company?

A. We do general ship repairing, which goes into all phases of structural work, engineering work, renovating, overhauling, drydocking, refinishing and painting and so forth.

Q. What type of vessels?

A. Mostly steel — 95 per cent steel.

Q. Do you do ship repair work on yachts — steel yachts?

A. Yes.

Q. To what extent?

A. I would say that our business is composed of about 80 per cent — steel yachts, larger yachts.

Q. How large a yard is yours?

A. In extent, in size?

Q. Well, just to give us an idea, yes.

A. We have an enclosed basin where we have three piers, two of them are over 1000 feet long — 1305 feet, to be exact — one 900-feet. That will give you some idea as to the wharfage.

Q. How many vessels do you handle there in the course of a year?

A. That would be hard for me to say, whether it is 200 or 400—I have never really made a count.

Q. That will give us an idea—200 to 400?

A. I would say somewhere in there, yes.

Q. How many men do you employ there?

A. It varies from, I would say a minimum of sixty to a maximum of a hundred and sixty during the various seasons.

Q. Tell us personally about your own experience in connection with steel vessels—the repair of them.

A. Do you want me to go back from the beginning?

Q. Yes.

A. Well, I started in 1916 serving a shore apprenticeship in the Charleston Navy Yard, Charleston, South Carolina; from there I went into the Navy, went through the various schools, the electrical school, Brooklyn Navy Yard, the submarine school in New London, the submarine battery school, submarine gyro school and in the regular submarine service during the War. After the War was over, I came out and went to work for the Sperry Company over in Brooklyn in stabilizers, engine work—ship's stabilizers, gyro stabilizers, and from there I went to Boston and was with a large yacht while she was under construction there for Mr. Palmer, after which I went to sea for about eight years as an engineer. After that, I went with the Winton Engine Company at Cleveland as a guarantee engineer for a short time, and then to the Marine Basin Company.

Q. Your first position with the Marine Basin Company was as what?

A. Second Vice President.

Q. Since then, you have become President?

A. That is right.

Q. In connection with your work, are you familiar with cylindrical steel tanks for the storage and retention of gasoline on yachts and other vessels?

A. Yes, sir.

Q. Are you familiar with the process of caulking steel plates?

A. Yes, sir.

Q. I show you this Exhibit 164, and ask you what that is.

A. This is a sample of a piece of steel riveted work, if that is what you mean.

Q. Where did that come from, do you know?

A. Yes. It was made up in one of our shops down at the Marine Basin.

Q. What does that illustrate with respect to steel work?

A. It illustrates the modern practice of riveting and caulking.

Q. Will you show us the caulking on this exhibit and explain to us what it consists of?

A. The caulking is the righthand half of this sample—is caulked.

Q. When you are holding the exhibit with the rivet points toward you, is that right—the righthand end when you hold the exhibit with the rivet points toward you?

A. That is correct.

Q. The rivet heads, as distinguished from the points, are the hemispherical ends on the opposite side?

A. That is correct. You want me to describe this caulking?

Q. Yes, will you please do that?

A. Well, this caulking is done with what we call a standard round-nosed caulking tool in the regular fashion. The center of the plate edge is first split with your tool, then you go back and hammer the metal from the split in against the side of the plate, thereby forcing the edge of

this tight into the face of the plate here, making a caulked joint.

Q. And what is the purpose of caulking?

A. The purpose of caulking is to make it tight.

Q. You say the righthand part of this seam has been caulked?

A. That is right.

Q. How about the lefthand end?

A. The lefthand end hasn't had anything done to it, any more than just planed off.

Q. Does this exhibit illustrate the difference in appearance between the caulked seam and a non-caulked seam?

A... Yes, it does.

Q. The caulking that appears on this seam, will you tell me whether that is the normal size of caulking for that size plate, or not?

A. That is what we would call normal light caulking as opposed to heavy.

Q. Will you, on this exhibit, point out to us the nature of the riveting?

A. This riveting is standard button head countersunk type of riveting—rivets caulked.

Q. What is the purpose of caulking the rivets?

A. To prevent the rivet from leaking.

Q. And does this exhibit illustrate the manner in which that is normally done?

A. That is what we call standard practice.

Q. What do you mean by standard practice?

A. If we were going to build a tank or a vessel of any kind, we would employ that kind of construction.

Q. And when you say that kind of construction, what is it you are referring to?

A. The riveting and the caulking.

Q. Do you include the caulking of the rivets?

A. Absolutely.

Q. And you have in mind a tank for the retention of gasoline, when you say that?

A. Yes, I have—or pressure tanks.

Q. Does the tank for the retention of gasoline require any different standard or degree of care in construction than any other tank?

A. Yes, sir, it does.

Q. In what respect?

A. A tank for the retention of gasoline needs to be pretty well constructed for tightness.

Q. Why is that?

A. Because gasoline will eat its way through, wherever a leak it apt to form, where rust is formed. Gasoline is harder to confine than water, in other words.

Q. What is its effect on rust, where rust is present?

A. Gasoline will eat its way through rust.

Q. You have shown us this Exhibit 164, illustrating caulking. I would like to ask you to examine, for instance, Exhibit 157, the seam on the outside and the seam on the inside, and tell us whether those seams have been caulked?

A. No, sir, these seams have not been caulked.

Q. How are you able to determine that?

A. Because there are no caulking tool marks on them. The only marks I see here are shear marks.

Q. What are shear marks?

A. Marks that are left by the cutting shears when the plate is cut.

Q. What is the nature of those marks which you see?

A. Well, take for instance this edge left on this plate (indicating).

Q. You are referring to the inside edge of this exhibit?

A. That is correct. Without having examined the edge of this plate, you could see that this plate was sheared in this direction—the cutting edge of the shear pushed this feather out.

Q. We have the exhibit lying with the number down, so we are looking at the interior of the tank, and I think you called attention to the upper edge of the upper plate, is that right?

A. Yes.

Q. And you say there is a feather that shows which is the cutting mark and which is the shearing mark?

A. This feather was left by the shear—as the shear came through cutting this plate out, simply pushed over this little burr or feather.

Q. If these seams that you have examined had been caulked, what would be the difference in their appearance from what you observe?

A. If this seam was ever intended to be caulked, in the first place it would have been chipped or planed and then you would see the tool marks from you caulking tool. This top edge that I spoke of a minute ago would be split in the center, and the inner part of the metal forced in against this bottom plate, thereby making a joint.

Q. That is as it appears in this Exhibit 164 at the right-hand side?

A. That is correct.

Q. Am I correct that the inner edge would show a depression as a mark of the cutting tool, or a trench?

A. That is right, it would show a depression, as you can see by looking at this plate edge here (Exhibit 164).

Q. Referring to Exhibit 164?

A. Yes.

Q. I call your attention to Exhibit 160, and ask you to examine the inner and outer seams of that plate and tell me whether or not that has been caulked.

A. Very definitely not, there has never been a caulking tool on that.

Q. I show you Exhibit 159. First, the outer seam has some solder covering it in parts; turning it over and referring to the seam on the opposite side, I ask you to ex-

amine that and tell us whether that has been caulked or not.

A. No, sir, that has not been caulked.

Q. I ask you to turn it over to the side where there has been solder—and the solder is still present in the major part of the seam—and ask you if you can tell me from the parts of the seam which are exposed, whether that seam has been caulked or not.

A. No, sir, they have not.

Q. I refer you to Exhibit 5-X, a section of the bottom seam of one of the tanks, and ask you to look at that and tell me whether that seam has been caulked.

A. No, sir, that has not been caulked.

Q. I ask you the same question with respect to Exhibit 5-Z?

A. That has not been caulked.

Q. I ask you the same question with respect to 6-A.

A. No, sir, that hasn't been caulked.

Q. I ask you the same question with respect to Exhibit 5-Y.

A. No, sir, that hasn't been caulked.

Q. I show you Exhibit 158, which is a section cut from the top of this tank, and ask you whether that seam has been caulked either inside or out.

A. No, sir, that has not.

Q. Now, with respect to the outside seam, can you tell us whether or not it would be practicable to caulk that seam?

A. The outside seam?

Q. Yes.

A. No, sir, you could not caulk this seam.

Q. Why not?

A. Because the overlap in the plate is not in line with the flat surface.

Q. What difference does that make?

A. Well, it makes this difference: The crown of this head starts to fall away from this seam, and all you would

accomplish by caulking would be simply push the plate over it—you have no foundation to caulk on.

Q. Does your experience include the construction of gasoline tanks such as—well, the general character—I don't refer to workmanship of these tanks from which we have sections here.

A. Yes, I have constructed quite a number of them.

Q. What is necessary with respect to the riveting of such tanks when they are constructed for the purpose of retaining gasoline?

A. I don't believe I quite understand that question.

Q. Well, assuming that you are constructing a cylindrical steel tank for the purpose of retaining gasoline, and, of course it is a requirement that be tight for the retention of gasoline, what in a general way are the precautions and the character of riveting that is required for that purpose?

A. Well, of course in the first place, your punching or drilling, as the case may be, if the holes are punched they should be properly reamed to the proper size, the proper size rivet for the kind of tank you are going to build, depending on the pressure you are going to carry, or if gasoline tanks like these, the right sized rivet, right sized spacink and correct workmanship in the riveting and caulking—rivets caulked and seams caulked.

Q. I show you Exhibit 158, and call your attention to the rivet hole appearing therein, from which a rivet has been taken out, and ask you to tell us first of all what you observe with respect to that rivet hole.

A. The two holes are out of line, they were never reamed, and from the elongation of the hole itself, it is clearly evident that a drift was used instead of the holes being reamed.

Q. What difference does that make?

A. It makes this difference: That when holes are so poorly punched and so far out of line, and a drift has to

be driven into these two holes to try to bring them in line, it inevitably elongates both holes, and when a rivet is driven in it is driven in at an angle, and the shank of the rivet does not fill the hole and it makes a leaky job.

Q. Is the use of a drift good practice in construction of a gasoline tank?

A. No, sir, it is not.

Q. If this hole had been reamed, what difference would there be in it?

A. It would be a straight hole.

Q. I call your attention to Exhibit 6-A, a section from the bottom of one of these tanks in question, and ask you to observe the riveting on that section and tell us what you observe with respect to it?

A. The same thing applies here: These holes—at least three of them definitely are badly out of line—the rivets driven in at an angle which indicates that they were not reamed.

Q. What difference did that make with respect to the tightness of the tank?

A. When a rivet is driven in this manner?

Q. Yes.

A. The shank of the rivet doesn't fill the hole, therefore it leaks.

Q. I ask you to examine the points of those rivets and tell us what you observe.

A. Well, in the first place, the points were poorly headed up. In two cases here they were just bent over, you might say, to one side, which indicates a very poor riveting job.

Q. Would you consider a tank constructed with that type of workmanship was a proper tank for the storage of gasoline?

A. No, sir, I would not.

Q. I ask you to observe Exhibit 160, and tell me what you observe with respect to the riveting of that section.

A. You want me to confine my remarks to the rivets only?

Q. No, having in mind that we are interested in the adequacy of this tank for the retention of gasoline, tell us what you observe about it.

A. In the first place, the shearing of the steel plate is very bad indeed. You can see where the shears ran off here in the center, gouged the plate out close to the rivet hole and started off in a new line. The rivets themselves are very badly driven.

Q. In what respect?

A. Whoever drove those rivets headed them up in such a fashion as to split them at the edges—they are all mushrooms—split at the ends of the mushrooms.

Q. What difference does that make?

A. I would say that those rivets were driven cold—it looks like a cold-driven steel rivet to me—and so much hammering or so much driving on them that they crystallized and split, and probably they were the wrong length to begin with, which means that the shank of this rivet hasn't made up or filled the hole.

Q. Why do you say you think they were too long to begin with?

A. Because of the fact that they have had to be driven down and mushroomed so much to get down to the steel plate.

Q. What do you observe with respect to the rivet points, as to whether they were actually driven down to the steel plate or not?

A. Well now, you can see here that these rivets were all different lengths. Here is one that looks like a fair job, right in the center.

Q. You are referring to the one which is ninth from the right hand side when the Exhibit-160 is held in an upright position?

A. I only say fair. A good many of these rivets you can see right under the head—they are not driven home.

and of course in this type of rivet you can't caulk them, you can just drive them up as tight as you can, and of course the seam itself is not caulked.

Q. Why do you say that you can't caulk rivets of that type?

A. To caulk a rivet you must have the type of construction that we are looking at here.

Q. In Exhibit 164?

A. Yes.

Q. And how is that different from the type that is in Exhibit 160?

A. This particular type of rivet is a countersunk rivet, and is flush-driven (indicating Exhibit 164), and therefore has a caulking edge to it that can be caulked. This type can't be caulked (referring to Exhibit 160).

Q. How essential is caulking in a gasoline tank?

A. There is no other way of making a rivet tight, there is no other way of making a seam tight—that is, I say no other way—that is the standard practice that we employ. There is such a thing as welding—welding seams, butts and rivets—but ordinarily when we build a steel welded tank we expect to make that tank tight by riveting and caulking—welding is resorted to under other conditions.

Q. I call your attention to the rivets on Exhibit 157, and ask you to tell us what you observe there?

A. This is the same type of riveting we have been looking at in Exhibit 160, I don't see any material difference, it looks the same to me.

Q. The same comments would apply?

A. Yes.

Q. And with respect to Exhibit 159?

A. That is exactly the same type of riveting.

Q. I show you Exhibit 158, a section from the top of the tank.

A. (Examining same.) This is also the same.

Q. I show you Exhibit 5-Z, and ask you what you observe with respect to the riveting on that section.

A. (Examining same.) That is the same type of riveting.

Q. Can you tell us whether the holes for those rivets have been reamed?

A. I would say that they have not.

Q. Why do you say that?

A. Because they don't line up.

Q. Are you familiar with the process of soldering?

A. Yes, sir.

Q. I ask you to examine Exhibit 160, and ask you if you can tell us whether the outside seam of that section has at any time been soldered, and ask you to bear in mind the fact that this tank has been through a fire and it has been suggested that there may have been solder there originally which ran away as a result of the fire.

A. This seam has never been soldered.

Q. Why do you say that?

A. If it had, there would be indications of the tinning still there, regardless of the fire.

Q. Do you find any indication of tinning still there?

A. None whatever.

Q. Why would you expect to find evidence of the tinning still there?

A. You will find in soldering steel particularly—and it is not a very successful process—that you have to use very strong acid to clean the surface before you start to tin, and once tinned and soldered, no matter how much heat you might apply to that joint or that surface, you will still see the tinning there, you just can't—I don't believe—burn it off without melting the whole plate.

Q. I show you Exhibit 159 and ask you if there is anything on that plate that illustrates what you say.

A. Well, you can see here that evidently part of this solder has been melted away—melted and run off.

Q. Where do you observe that?

A. At the two ends. I can very distinctly see the tinning that is left on the steel.

Q. This plate, I will tell you, was cut as a section of the side of the tank by use of an acetylene torch. What would the effect of that on the solder be, of the metal itself?

A. The temperature at the point of burning would be pretty high point, 3000 degrees Fahrenheit, and that being the case this temperature naturally would melt this solder back for a ways—I assume that is what happened from the looks of the plate.

Q. Does the tinning still remain?

A. Oh, very definitely.

Q. How close does it come to the edge of the plate that was burned?

A. The tinning that I see here?

Q. Yes.

A. It looks about an inch and a half.

Q. I mean does it extend all the way up to the edge now at present, or did it stop short of the edge?

A. Oh, I see what you mean. All the way up to and overlapping the edge that was burned.

Q. I show you this Exhibit 157, and ask you to examine the seam there and tell me whether that has been soldered or not.

A. There is no evidence of having been soldered.

Q. And your reasons are the same as given with respect to Exhibit 160?

A. Yes, sir.

Q. I show you Exhibit 6-A, which you observe as having been some solder in the bottom seam, and ask you whether the rivets have been soldered.

A. No, sir, these rivets have not been soldered.

Q. I ask you the same question with respect to Exhibit 5-Y.

A. No, sir, these haven't been soldered.

Q. I ask you the same question with respect to Exhibit 5-Z.

A. No, sir.

Q. I ask you the same question with respect to Exhibit 5-X.

A. No, sir.

Q. In a previous answer you said something about solder on this type of construction not being very successful. What did you mean by that?

A. It is very very difficult to get solder to adhere to steel or iron, it has never successfully, to my knowledge, been done.

Q. In your opinion, is soldering a seam in tanks of this construction, a safe method of protecting the seam from gasoline leakage?

A. It definitely is not.

Q. Why is that so?

A. Because of what I have just said relative to the success of soldering steel or iron.

Q. I call your attention to Exhibit 158, which is a section from the top of one of these tanks, and ask you whether that has been soldered or not.

A. The seam or the rivets or both?

Q. Both.

A. No, sir, there has been no soldering here.

Q. Why do you say that?

A. There is no evidence of solder anywhere, there is no evidence of tinning anywhere, and if this seam, for instance, had been soldered, there would be evidence of it from releasing this rivet.

Q. Where would that appear?

A. It would appear between the two laps.

Q. It has been suggested that this seam, which was at the top of the tank, originally contained solder, and due to the fact that the tank had been through a fire, that the solder was reduced to a powder which was there after removed by the influence of the elements. In your opinion, is that possible?

A. I have never heard of such a thing before, I couldn't say whether solder could be reduced to powder and blown

away or not. However, if that had taken place, there would be evidence of soldering here—left here.

Q. And you find none?

A. I find none whatever.

Q. Let me ask you, Mr. Nelson: From your observation of the materials and workmanship, as contained in these exhibits that you have examined—157, 158, 159, 160, 5-X, 5-Y, 5-Z and 6-A, whether tanks so constructed, of the dimensions of forty-two inches diameter and seven feet length, installed vertically, in your opinion would they be proper and safe tanks for the storage of gasoline in a yacht for use as the fuel supply for her main engines?

A. In my opinion, they would not.

Q. And why do you say that?

A. Because of the fact that the tanks were very poorly constructed and very definitely would leak, and I think that is reason enough.

Q. Referring again to Exhibit 158, and looking at the inside of it, I would like to ask you to tell me what you observe with respect to the fitting of the crown to the side plate and the workmanship there.

A. Are you referring now to the crown itself?

Q. Yes.

A. The crown itself is poorly constructed in that the flange is not deep enough and very badly sheared.

Q. When you say badly sheared, what are you referring to?

A. The ragged edge of the shear itself.

Q. Just below the open rivet hole?

A. Just below the open rivet hole, where the tool again slipped and cut in close to the rivet hole and was just left, and started off in another direction, or continued on. The holes, of course, were punched—they were not drilled—and they certainly were never reamed, and there is no chance in the world for a caulking edge on these seams.

Q. I call your attention to the fact that in the way of this rivet hole, the plates have been separated to a certain extent. Can you look through between them there?

A. Oh, yes, you can see daylight right straight through.

Q. What do you observe as you look through there?

A. Are you referring now to the condition of the metal itself?

Q. Yes.

A. I can see rust—the condition of those two surfaces appears to be exactly the same as the inside surface of the tank itself.

Q. And what is that?

A. Rust.

Q. Referring to the condition of Exhibit 160, you have commented on the condition of the rivet heads and seam. Taking into account the fact that this piece of plate is said to have been through a fire, will you tell us whether, in your opinion the conditions that you have described—commented on—could have been caused by a fire or deterioration since the fire in the last four years?

A. The conditions I commented on were certainly not brought about by this plate having been subjected to heat.

Q. Have you observed any evidence of distortion due to the fire, on that exhibit?

A. No, sir, I did not.

Q. I ask you to observe Exhibit 157, and tell us the same things with respect to that plate, as to whether conditions are accounted for by fire or by corrosion since the fire—the conditions on which you commented.

A. The surface condition of this plate, Exhibit 157, seems to be different, of course in that the galvanizing has practically disappeared and there has been corrosion.

Q. Do you see any other evidences of distortion due to fire?

A. No, that is the only difference I can observe between the two plates.

Q. You mentioned galvanizing. Referring to these exhibits, can you tell us whether these tanks were galvanized after manufacture or not?

A. No, sir, they were not.

Q. How can you tell that?

A. If the tank was galvanized after manufacture, the galvanizing would fill up the cracks in the seams and also fill up the openings under the rivet heads, and there is no evidence of any such thing here, and besides, these rivet heads or rivet points were never galvanized, and the plate is, so that this tank was never galvanized after it was constructed.

Q. You have been referring to Exhibit 160. Are your comments true with respect to the other exhibits, 157 and 159, for instance?

A. Due to corrosion, and a little evidence of any remaining galvanizing on this plate, it is difficult for me to say—157. There is a slight evidence of galvanizing on the plate itself but none whatever on the rivet points.

Q. 159?

A. I would say the same thing for 159 as I have just said for 157.

Q. Do you see any evidence of galvanizing on the rivets on this Exhibit 6-A?

A. I can see no evidence.

Q. 5-Y?

A. No, sir.

Q. 5-Z?

A. No, sir.

Q. 5-X?

A. No, sir.

Q. One more question about the soldering: As you noted, there is evidence of solder on the bottom seam, but you said there was no evidence of solder on the rivets around these sections from the bottom seam. Assuming that solder was used on the bottom seam, but not on the

rivets, what would the result be with respect to the tightness of the tank?

A. If it was possible to make the seam itself tight, of course the seam wouldn't leak, but that wouldn't prevent your rivet from leaking, which means that it wouldn't prevent the gasoline from draining out of the tank and into the bilges, or wherever it would go. In other words, if you had leaky rivets, it would be no good to solder the seam of the tank and leave the rivets unsoldered, or whatever you were doing to them.

Q. I show you Exhibit 163, and ask you if you can tell me what that is.

A. This is a caulking tool.

Q. Is that the usual type of tool that is used in caulking processes you have described?

A. For certain sized work, yes.

Q. Is that the proper size for such work as has been done on Exhibit 164?

A. Yes, it is, it is the right sized tool.

Q. I show you Pilkington Exhibit 17, which consists of parts of two rivets, one of which is said to have come from this open rivet hole on Exhibit 158, and ask you to observe these two rivets and tell me what you observe with respect to them.

A. The rivets, of course, were driven through a hole or through two holes out of line.

Q. How can you tell that?

A. This rivet does not form a right angle—the shank of the rivet is not a right angle to the head, it is crooked over and that is due to having been driven through holes out of line—forced out of line—and it is clearly evident that the shank of these rivets certainly never made a joint or never filled the two holes in the plates—very evidently loose.

Cross Examination:

By Mr. Underwood:

Q. When did you become associated with the Marine Basin Company?

A. January 1, 1929.

Q. You said something about serving an apprenticeship in 1916—as what?

A. I don't quite understand that—where?

Q. As what?

A. In the Charleston Navy Yard?

Q. Yes.

A. Apprentice electrician.

Q. That is where your experience with ships began?

A. That is right.

Q. Then you went into the Navy?

A. That is right.

Q. What was your rank in the Navy?

A. I went in the Navy as landsman for electrician, and I went to the schools that I mentioned a while ago, came out of the schools as third class electrician, second class, first class and finally chief electrician on board a submarine.

Q. And your rank in the Navy, when you left the Navy, was chief electrician?

A. That is right.

Q. In the Sperry Company, your work, if I understood correctly, was in connection with ship stabilizers?

A. Gyro stabilizers, yes.

Q. You said you were then, for a time at Boston, in connection with the construction of a yacht?

A. That is right.

Q. What yacht was that?

A. The yacht Guinevere.

Q. What type?

A. Three-masted auxiliary schooner, 195 feet long.

Q. What did you have to do with her construction?

A. I was superintending certain phases of it for the owner.

Q. What phases?

A. The engineroom in particular—her engineroom machinery.

Q. For example, what machinery?

A. Her Diesel engines, electrical equipment and general engineroom equipment.

Q. Was it in her that you went to sea as an engineer for eight years?

A. Yes.

Q. So that you were to be the engineer of that vessel, and you represented the owner in some measure during her construction?

A. That is right.

Q. Thereafter, I think you went with the Winton Engine Company?

A. Yes, I did some guarantee engineering work for them for a short time.

Q. On vessels?

A. On vessels.

Q. And from there you went directly to the Marine Basin Company?

A. That is right.

Q. Your work there is as an executive, I take it?

A. That is right.

Q. Where is your plant, Mr. Nelson?

A. Right here in Gravesend Bay, Brooklyn.

Q. Have you installed any cylindrical steel gasoline tanks on any yachts that have been built at your plant?

A. Oh, yes.

Q. As large as 500 gallon capacity?

A. In one tank?

Q. Yes.

A. No.

Q. What is the largest that you can recall offhand?

A. Oh, it would be hard to say, I would say 36 to 40 inches in diameter, five to six feet long.

Q. Have you ever done any caulking yourself?

A. Only in school.

Q. At what school?

A. Brooklyn Navy Yard.

Q. That was in connection with the electrical school or the submarine school?

A. The electrical school, I spent eight months in the electrical school there and we took up general machine shop practice.

Q. How did you happen to make this Exhibit 164?

A. Mr. Thompson asked me to have it made.

Q. Were you there when it was made?

A. No.

Q. What did he ask you to make?

A. He drew out a sketch of just what you see there—a specification.

Q. Do you have that with you?

A. No, I haven't, I gave it to the machine shop foreman and he made the sample.

Q. What instructions did you give to the machine shop foreman?

A. To make me up a sample according to this sketch and specification.

Q. What did the specification say about caulking?

A. Caulk one-half of the seam.

Q. Is that all it said about caulking?

A. That is all.

Q. You said that the edge to be caulked was first split, is that correct?

A. That is right—we call it split—you split it with one edge of that caulking tool through the center.

Q. The same tool as this (indicating Exhibit 163)?

A. Yes.

Q. You first learned about caulking at the Brooklyn Navy Yard, is that right?

A. That is right.

Q. I understand from what you said that your only subsequent experience with caulking is since you have been associated with the Marine Basin Company, am I right about that, or wrong?

A. That is mostly correct, I would say. My experience with caulking—I don't know just what you mean by that.

Q. I mean with the process, and not the familiarity with seeing plates being caulked—with the process of caulking.

A. No, then that is not correct.

Q. What is not correct?

A. I have been familiar with it since 1916, if I understand your question right. I have been around where it was being done most of that time.

Q. Did you have anything to do with caulking as an apprentice at the Charleston Navy Yard?

A. No.

Q. Your first personal familiarity with the process was at the Brooklyn Navy Yard, is that right?

A. No, I wouldn't say that is correct. I would say that the only caulking I ever did with my hands was in school at the Brooklyn Navy Yard.

Q. Did you have anything whatever to do with caulking at the Charleston Navy Yard?

A. No.

Q. And you went from there to the Brooklyn Navy Yard?

A. Yes.

Q. So that your experience at the Brooklyn Navy Yard is your first experience with caulking, isn't that so?

A. That is right.

Q. You didn't have anything to do with caulking with the Sperry Company, did you?

A. Yes, I did.

Q. Tell me about that.

A. The work that I did for Sperry had to do with not only the building but installation of these gyro stabilizers, where considerable iron work had to be done, and I was Sperry's guarantee engineer on these installation jobs that I saw, so naturally I laid out a good deal of steel work to be done, where riveting and such work was done.

Q. What sort of steel work?

A. Foundation work.

Q. You mean structural hull work?

A. Yes.

Q. Any tank work?

A. In this particular case, no.

Q. This Exhibit 164: Do you know whether that was caulked with a power tool or a hand tool?

A. I happen to know that it was caulked with a hand tool—now, wait a minute—this particular tool here was the one we did the job with—that is a power tool—but in using that tool to do this caulking it was done by hand—is that clear enough? That is ordinarily a tool that is used in a power hammer (indicating Exhibit 163).

Q. I understood you to say, Mr. Nelson, that these tanks very definitely would leak, is that correct—is that your opinion?

A. That is my opinion, yes.

Q. Do you mean by that that they would leak from the moment they were built, as soon as gasoline was put into them?

A. It wouldn't be very long.

Q. How long—a matter of hours?

A. That is impossible for me to say how long exactly, but gasoline has a cutting effect on this kind of business, and it wouldn't take so very long.

Q. Well, I want to get clearly on the record just what your opinion is on that point. Do you say that these tanks were constructed in such a way that they weren't tight at the outset?

A. I can't possibly see how they could be.

Q. Well, you haven't quite answered my question. I think perhaps you can say either yes or no to this question: Do you say that these tanks were so constructed that they would leak from the moment they were put into use as gasoline tanks?

A. Yes.

Q. Well, can you show me just where any particular one of these things would leak, from the very beginning?

A. There are many rivets there that would leak.

Q. Right away?

A. I believe so.

Q. Well, which ones would leak right away?

A. This rivet here would leak (indicating the rivet under the red dot on Exhibit 6-A).

Q. Any others?

A. I believe that most of the rivets in the way of the center of this seam here would leak (indicating Exhibit 160)..

Q. Any others?

A. Oh, there are probably many more, I have to take a magnifying glass to find some of them—those are the worst ones.

Q. Those would leak right away?

A. I believe they would.

Q. Of course, if the rivet that you first pointed out—the one on Exhibit 6-A under the red dot—leaked, that would necessarily involve a leak first in the seam between the crown and the side plate of the tank, wouldn't it?

A. In this particular case, that seam is open down to the rivet.

Q. You say it is?

A. Yes, so far as fluid is concerned.

Q. So it is your testimony that from the time these tanks were first put into use as gasoline tanks, there was a leak at that particular rivet?

A. No, I didn't say that. I said I don't see any reason why these tanks wouldn't leak with this type of con-

struction. Now, what happened to that particular rivet, between the time that this tank was first put into use, and what I see now, is a different thing. This rivet may have been burred over, and that burr rusted away since this tank was first put into use. However, that rivet would stand a might good chance of leaking when it was brand new.

Q. Now you don't say it would leak from the very beginning?

A. I can't say, because I don't know what condition that rivet was in from the beginning—that is the head of the rivet.

Q. And of course, you don't know when the head of the rivet got into the condition it is now in, do you?

A. No.

Q. Turning over to Exhibit 160, which is before you there: Do you say those rivets would leak from the very beginning?

A. I say I believe these rivets would leak, yes.

Q. So assuming these tanks were installed in this vessel in 1922, and this fire occurred in 1935, that particular tank leaked every time there was gasoline that high in the tank, is that right?

A. I don't know that they did, but I say I believe that they would have leaked.

Q. You have been called here, Mr. Nelson, as an expert to express an opinion about these tanks, and I want to get that opinion clearly on the record: I want to know whether it is your opinion that that particular tank, Exhibit 160, leaked at the places you have mentioned—the rivets you have pointed out—from the time the tank was first built?

A. I believe, looking at this construction, that this tank leaked when it was first built, yes.

Q. So that that tank would leak from 1922 to 1935 every time it was filled with gasoline up to that point, is that your testimony?

A. I believe that to be true, yes.

Q. You don't solder tanks at your plant, is that correct?

A. We don't solder steel or iron tanks, no, sir.

Q. I think you said that if the seams of these tanks, for example the seams shown in Exhibit 160, had once been soldered, you would still see signs of tinning notwithstanding it has been through a fire. What do you refer to by tinning?

A. When you are going to solder a joint or solder a seam, you first clean that to clean bright metal by use of a scraper, wire brush or emery wheel or some such instrument, to clean all the rust down to bare metal, and use acid and use a soldering iron and solder and put a light coating of solder on that surface—that is tinning. Then you can go ahead and adhere solder to that tinning.

Q. Is the tinning that you refer to the same substance as the solder itself?

A. Yes, sir.

Q. But applied at a slightly different time?

A. Yes.

Q. If the fire is hot enough to burn away the solder which is applied after the first tinning has been applied, why doesn't it burn away the tinning too?

A. The tinning for some reason or other adheres to the metal more firmly than the balance of the solder that is put on. I don't know just why extreme heat won't take it away, but it will not.

Q. Then if the original tinning adheres to the metal, why is the second coat put on?

A. The tinning is a couple of thousandths of an inch thick—the tinning of itself wouldn't form a joint.

Q. You mean that the coat of tinning, as distinguished from solder, is only about two-thousandths of an inch thick?

A. Or less.

Q. But that won't burn away, you say, although the solder itself, which may be an eighth of an inch thick, will, is that right?

A. That is not entirely correct. The solder, including the tinning—or the solder in the tinning—will melt and run away, but that bright surface caused by the tinning will remain there.

Q. What is the bright surface—is it part of the tinning or is it something else?

A. It is part of the tinning, yes.

Q. What is this substance used in tinning—is it any different than solder itself?

A. No, it is solder, it is the same thing.

Q. Then what is the bright material that it leaves behind if the solder melts and goes away?

A. That is the tinning.

Q. If the temperature is raised to such a high point that it will melt the solder and cause it to run away, why doesn't that solder which goes under the name of tinning, dissipate and run away too?

A. I am not enough of a chemist to tell you that, all I can tell you is I know it won't.

Q. What do you base that on? Have you had any experience with tanks that have been through fires?

A. No, but I have had experience with materials that have been in the fire for various reasons. I know that you can take—I have experimented with it personally—you can take and tin a surface and go ahead and do your soldering, and then you can take a blow torch and put on that surface and run all of the solder off of it and hold the blow torch there all day and you still have your tinning left underneath that—bright.

Q. Have you done that yourself?

A. Yes, I have carried on, a few years ago, long experiments in the soldering of castiron in particular—with no success whatever, incidentally.

Q. Do you know at what temperature solder melts?

A. Around 450 degrees, Fahrenheit.

Q. How about zinc?

A. Zinc, 750 degrees, I believe.

Q. You expressed the opinion that fire could not have caused the condition of these exhibits that you have commented on, by that do you mean the structural conditions?

A. I meant this: I was commenting on the riveting and the caulking—the structural condition.

Q. You mean to say, I take it, that the fire wouldn't cause cracks in the points of the rivets, such as you see on Exhibit 160, is that what you mean?

A. No, sir, they would not.

Q. Or fire wouldn't cause the little edges on the points of the rivets that you have noted on Exhibit 160, is that what you mean?

A. No, sir, they would not.

Q. Well, of course, fire plus exposure to alternating air and water over a period of four years, would cause considerable rusting, wouldn't it?

A. That is correct.

Q. Noting the points of the rivets on Exhibit 6-A, you see quite a lot of rust around those points, don't you?

A. There has been rust there, yes.

Q. There still is?

A. There still is, it has been cleaned somewhat.

Q. Exposure to the atmosphere and water alternating over a period of four years, could cause a great deal of that, couldn't it?

A. Well now, that depends on what condition the steel was lying in, when you say a great deal.

Q. The rusting process will begin as soon as you expose metal of this kind to air and water alternately, will it not?

A. That is in the water and out of the water—and in and out?

Q. Yes.

A. Yes, there will be rust, of course—erosion.

Q. It will begin as soon as you subject metal to these conditions, will it not?

A. Yes.

Q. And it will go on continuously too, will it not, as long as those conditions remain the same?

A. That is what it will do.

Q. And of course you get rust at a more rapid rate when you alternate exposure to air and water on the one hand, than you do when you have the metal exposed only to the air or only to the water, isn't that so?

A. Yes.

Q. So isn't it a fact, Mr. Nelson, that the present condition of the rivet points of Exhibit 6-A is not a fair criterion by which to tell their condition four years or more ago?

A. That question is rather misleading.

Q. I don't want to mislead you, and you are bright enough and intelligent enough to take care of yourself, and answer it any way you want.

A. The rivets, as I see them here, while there has been a rust condition, it is clearly evident that they were very poorly driven in the beginning, because you can see the shank of this rivet here (indicating the one under the red dot) entirely clear of the hole in one direction, which originally bent over against one side of the hole.

Q. Do you say that particular rivet point never extended over the plate to cover up the hole between the shank and the edge of the plate?

A. I wouldn't say that, no. That rivet head may have been feathered over so it covered over the hole, but the shank of the rivet didn't fill the hole.

Q. Is it your testimony that there never was any metal from the rivet in the present aperture between the shank of the rivet and the hole in the plate?

A. I say that the shank of this rivet never filled this hole to begin with.

Q. How about the head or the point when it was turned down when driven?

A. The head of the rivet, when it moved over might easily have extended over the hole—that may have rusted away—but it would never have made the hole tight.

Q. You don't think it would?

A. No, sir.

Q. You said, with reference to one of these rivets which is part of Pilkington Exhibit 17, as I understand it, that it never filled the hole and was very evidently loose—did I understand you correctly to say that?

A. That is what I said.

Q. And do you mean to say that one of these rivets from the very beginning was loose in the tank?

A. We use that term to mean that the rivet was not tight, it doesn't mean that you could take and wiggle the rivet. When we say loose, we mean leaking—not tight.

Q. Does that apply to one or both of these?

A. That applies to both of these.

Q. So that from the very day this tank was completed and put into use as a gasoline tank, it is your testimony that both these rivets leaked?

A. It is my testimony that both of them very likely did leak.

Q. As I see it, there are two possibilities: They either leaked or they didn't leak. Now, at the moment, I am not interested in whether they are likely to leak or whether they may have leaked, but only whether they did or did not. Now, what is your testimony on that—did they or did they not leak?

A. I have no way of knowing whether they did or whether they did not.

Q. Can you, from what you have seen, express an opinion as to whether they actually did or did not leak from the very beginning?

A. My opinion is—my honest opinion is that these tanks did leak from the beginning.

Q. These two rivets leaked from the very beginning (Pilkington Exhibit 17)?

A. We are talking about the tanks now.

Q. Well, say the tank leaked in the way of these two rivets from the very beginning—is that your testimony?

A. In my opinion I believe that they did.

Re-Direct Examination.

By Mr. Matteson:

Q. Referring to Exhibit 6-A, you have been asked some questions about the corrosion on the points of the rivets. I will ask you to compare the corrosion on the points and on the heads and tell me what you see.

A. There has been very little erosion on the heads. There has very definitely been more on the points.

Q. Does the condition of the heads give you any indication of the extent of the corrosion on the points?

A. None whatever. Evidently the heads of the rivets were protected by some means, and the points or the outside rim of the tank exposed to moisture or some other condition, because there is a difference in the two conditions.

Q. If the tanks were standing on wooden platforms on this end (indicating Exhibit 6-A) would that give greater protection to the inside or outside?

A. Sunken into the wood?

Q. Sunken somewhat into the wood.

A. More protection to the inside.

Q. Referring to this Exhibit 164, something has been said about specifications to which this was prepared. Was there any indication given to you with respect to the nature of the caulking that was to be placed on it?

A. No, sir.

Q. Does that caulking, as shown on Exhibit 164, represent normal practice?

A. That is correct.

Q. Did you exaggerate it to any great degree at all?

A. The caulking of the rivet heads I would say was exaggerated to some degree.

Q. How about the caulking of the seams?

A. No.

Q. Do you recall whether you were requested to caulk the rivet heads or not?

A. No, we were not.

Q. Did the specification consist of any more than the thickness and dimensions of the plate and the fact that the seam was to be half caulked?

A. Nothing more except the rivet spacing.

Q. Is the workman who actually did this work here?

A. Yes, he is.

Q. What is his name?

A. Thomas Hansen.

4745 THOMAS HANSEN, being duly sworn and examined as a witness for the libelants, testified as follows:

By Mr. Matteson:

Q. Where are you employed?

A. Marine Basin Company plant.

Q. What is your position there?

A. General foreman.

Q. Do you know about caulking steel plates?

A. Yes, I should say I do.

Q. Have you done it yourself?

A. Yes, sir.

Q. How many years experience have you had in that sort of thing?

A. I started in this business when I was fourteen years old, and I have, off and on, all these years, done it quite often.

Q. I show you this Exhibit 163, will you tell me what that is.

A. That is a riveted joint where you proceed to make a tank of any vessel holding liquid.

Q. Did you make that?

A. Yes, I made this sample.

Q. How did you come to make it?

A. By request of my employer.

Q. Were you given some sketch or instruction with respect to making it?

A. Yes, I was.

Q. Have you that with you?

A. No, I have not.

Q. What did it consist of?

A. It consisted of an outline of the spacing of the rivets.

Q. What instructions were you given with respect to caulking the seam?

A. To caulk the half of the seam so that you could readily see the difference between an uncaulked and a caulked seam.

Q. Were you given any instruction as to the width of the caulking?

A. No, sir, I used my own judgment on that. I done that so often before, and I never got instructions of that kind.

Q. Does that exhibit show the usual caulking for a plate of that size?

A. Yes, it does, the usual procedure.

Q. How about the rivets?

A. You mean the spacing of the rivets?

Q. The caulking of the rivets.

A. Yes, that is the usual way of caulking rivets like these.

Q. Did you caulk the rivets?

A. Yes, sir.

Q. Did anybody give you explicit instructions about that?

A. No, this is the usual procedure to caulk rivets of this kind.

Q. For tanks for carrying gasoline?

A. Any liquid for that matter.

Q. What is this Exhibit 163?

A. The caulking tool I used for this particular seam—I haven't got the tool for the rivets.

Q. Is that the usual kind of a caulking tool to use?

A. Yes, sir, it is.

Q. Just tell us how you caulked.

A. You will note this tool has an edge that is a little higher.

Q. One edge is a little higher than the other?

A. Yes, as you will see, and when you start caulking you first split your plate with the sharp edge, laying down like this, and then raise the tool up and force that remainder of the plate into the plate opposite, like you could see there (indicating Exhibit 164).

Q. Did you do this by hand or use a power tool?

A. I did it by hand—this is a power tool, but you can also use it by hand.

Q. And you used it by hand?

A. Yes, sir.

Q. Will you look at Exhibit 160 and tell me whether that has been caulked or not.

Mr. Underwood:

I object to this because of the agreement that Mr. Matteson made at the close of the last session in Miami, that he would call only two other witnesses in addition to Mr. Thompson, and I think it is a complete departure from our agreement to go into that with any more witnesses.

Mr. Matteson:

It is true that at Miami I said that I would call two additional witnesses on the subject of caulking. As long as Mr. Hansen prepared this exhibit, and has come here, I would like to ask him simply the question as to Exhibits 160, 157 and 159, as to whether they have been caulked or not.

Mr. Underwood:

I raise no objection to producing an extra witness with respect to the manner in which Exhibit 168 was prepared.

but I do object to your going on further with this witness about any pieces from the Seminole's tanks, on the ground it is an admitted departure from our agreement, which was a condition of our suspending taking testimony at that time.

Mr. Matteson:

I certainly don't want to be put in the position of violating any agreement, and I will concede the calling of an additional witness is a slight departure. However, as this witness is here and has prepared this exhibit, I would like to have him point out the difference between the seam on Exhibit 160 and 157 and the seam on Exhibit 164, and if Mr. Underwood considers that as a departure, it is quite all right with me for him to make the point and I would simply like to ask the questions of this witness, and if the Court thinks they should not be considered, that is quite all right too. As long as he is here, I don't want to miss the opportunity of asking the question.

Mr. Underwood:

I will object to it, and at the proper time move to strike it out as a violation of the agreement.

Q. Will you just examine this Exhibit 160, Mr. Hansen, and compare it with the caulked seam which you have shown us on Exhibit 164, and point out whether there is any difference between them.

A. There is a vast difference between them from a practical man's point of view.

Q. What is the difference?

A. In the first place, this is not prepared for caulking, and in the next place it never has been caulked, there is no caulking, so any practical man can see.

Q. I ask you the same thing about Exhibit 157.

A. Well, that is the same thing, only in this place here they have been inverted to reverse the plate and lay the

shearing edge in against, and in this case the shearing edge is out.

Q. That is in Exhibit 157, the shearing edge is laid against the inner plate?

A. Yes.

Q. And in Exhibit 160, the shearing edge is laid out?

A. That is so it appears to me.

Q. Is there any caulking on Exhibit 157?

A. Not that I can see.

Q. Looking at the reverse side of 157, is there any caulking that you can see on that plate?

A. No. If I might say so, it couldn't be done, it is impossible to do any kind of caulking inside, you couldn't get in there to do it, in a small tank of that sort.

Q. Well, aside from that?

A. There is none.

Mr. Underwood:

I would like to make this statement on the record: That I shall not cross-examine Mr. Hansen with reference to his opinion as to the condition as to caulking of the samples from the Seminole's tank, because I consider that testimony no part of the record in this case.

Cross Examination.

By Mr. Underwood:

Q. --Mr. Hansen, how long have you been with your present employer?

A. About fourteen years.

Q. You have been in this general line of work for longer than that?

A. Since I was fourteen years old, I am now fifty-three.

Q. Where was your work before you went with the Marine Basin Company?

A. In this country I have been with the Staten Island Shipbuilding Company for many years, and with the Barber Steamship Company repair shop I was before that.

Q. You mean the New York office of the Barber Steamship?

A. That is right—in their repair shop.

Q. And you had some experience abroad before that?

A. I had plenty of experience abroad.

Q. Where?

A. In Copenhagen I served my time with Burmeistr & Wain.

Q. At whose request did you make that little piece of metal?

A. My employer.

Q. Who?

A. Mr. Nelson.

Q. Did you have any discussion with anybody else about it?

A. No, sir, I was merely asked to make a sample which would compare with that small sketch he gave me.

Q. Did you talk with anybody else about it before you made it?

A. No, sir.

Q. Nobody at all?

A. No, sir.

Q. Is this the tool you used (Exhibit 163)?

A. Yes, for caulking the seam.

Q. Is that the kind of tool you ordinarily use for caulking, in your experience?

A. Yes, for that type of work.

Q. You pointed out that one of the points of this tool was longer than the other?

A. Yes, very little—you can see it.

Q. You first take the tool with the long edge down?

A. That is right.

Q. And split the plate?

A. That is right—split you might call it or get a line in it.

Q. And then you elevate the tool a little higher and hit it down?

A. Yes, that is right.

Q. You don't turn the tool over?

A. No.

Q. Mr. Hansen, you hold that tool in that caulking groove up to the light, you will see that you can't possibly get that tool all the way down in there so that it shuts out the light, isn't that true?

A. This tool, of course, when you caulk the seam down, you let it down this way here—this is the way the tool is laid down when you caulk it down (indicating).

Q. You are telling me you turn the tool over?

A. You can see yourself.

Q. Is that right?

A. Yes, after the first procedure, yes, that is right.

Q. When you turn the tool over and put the long end in, you can still see the light through there, isn't that so?

A. It might be so, I don't know about that, but that is the way it is done.

Q. Well, look at it.

A. I can't see any light through there now.

Q. You can't see any light through there?

A. No, I don't think you can either. After all, I couldn't tell the exact angle I held the tool.

Q. You mean to tell me you can hold that tool in there so you can't see any light through it?

A. I wouldn't say I can or can't, I don't know. Hold it in the proper angle you can't see no light through it.

Q. Can you find a way to hold that thing so you can't see any light through it?

A. Yes, I did it, I got glasses on too, I can see very good. You move it back and forth a little bit, this shows it is convex a little, so that will be—

Q. Did you ever use a bigger one than that on a 3/16-inch plate?

A. No, sir.

Q. Did you use a smaller one than that on a 3/16-inch plate?

A. No, I would say this is the right tool.

Q. Have you ever used a smaller tool than that on a 3/16-inch plate?

A. I couldn't say truthfully either, perhaps I have. This was the tool I picked out for this job.

Q. They come smaller than that, don't they?

A. Yes.

Re-Direct Examination.

By Mr. Matteson:

Q. How much smaller, Mr. Hansen?

A. As practical men, we don't measure tools like that, I couldn't say—a thirty-second—perhaps that would be the most.

Q. You mean 1/32 of an inch smaller than that?

A. Yes.

Q. That would be the smallest?

A. That is the smallest, otherwise it becomes a chisel.

Adjourned to 2 P. M., December 7, 1939.

Met pursuant to adjournment, 2 P. M., December 7, 1939.

Present as before.

4754 JOHN A. THOMPSON, having been duly sworn and examined as a witness for the libelants, testified as follows:

By Mr. Matteson:

Q. Mr. Thompson, in the first place we have an exhibit here; No. 164. Did you have something to do with the preparation of that exhibit?

A. Not with the preparation exactly, I asked Mr. Nelson of the Marine Basin if he would be good enough to prepare a small sample from two 3/16 inch plates riveted together, and to caulk half of one seam in order to show the difference between a caulked seam and an uncaulked seam in the same line. I didn't request him to do anything with regard to the riveting—the caulking of the riveting—apparently they did that on their own free will, all I gave him was a very rough sketch; approximately the size of these rivets, and marked off four rivets giving the distance of approximately 1 1/16 center and just said "Caulk half". I haven't got the paper, but I could repeat it if you want.

Q. Did you give any instructions with respect to the depth or nature of the caulking?

A. Nothing whatsoever. All I said in connection with the caulking was to caulk half the plate and to leave the other half uncaulked.

Q. Referring to that exhibit, will you tell us whether or not the caulking that appears there is normal caulking for that size of plate?

A. Yes, in my opinion this is just normal caulking?

Q. Will you explain to us briefly what the caulking consists of, as it appears there?

A. Well, there was a term used here yesterday that I don't normally use, because we don't split the plate, but the term is used here. We use a tool to give a line on approximately half the thickness and press the metal down slightly then, and then the final movement is by rocking the caulking tool and forcing that slightly displaced material of the outer plate close against the inner plate in order to close off the space there entirely. I think if you will look at the end of this plate you will see the part that has been closed off. It is closed off to about a depth of approximately an eighth of an inch, and the trench is slightly more than an eighth of an inch width, and I imagine, without measuring, somewhere about a thirty-second or a sixteenth of an inch in depth.

Q. Does that exhibit represent the normal appearance of a caulked seam?

A. This seam has the appearance of a normal light-caulked seam.

Q. Are you familiar with the process of caulking rivets as has been done on this exhibit?

A. Oh, yes.

Q. Is that a satisfactory method of making rivets tight?

A. Well, not a countersunk rivet, the only type of rivet you can countersink is the countersunk point rivet—that is the normal caulked rivet.

Q. Since you were last on the stand, you spoke to me about caulking on some of these exhibits. In the first place, I call your attention to Exhibit 157, on the back of which appears some blue crayon marks. Do you recall what those blue crayon marks are?

A. That was a mark made by Mr. Gibbs inside No. 4 tank, representing a picked sample of caulking, so I understood, of that particular seam.

Mr. Underwood:

I ask you to examine the seam on the inside of this exhibit and tell me whether you see any evidence of caulking there.

The Witness:

None whatsoever.

Q. Has that seam ever been caulked, in your opinion?

A. It has not.

Q. Why do you say that?

A. It is entirely free of all caulking tool marks, and still has shearing marks on the plate, very evident to me. I am not saying only on the edge but in the thickness of the plate there is evidence of shear marks on the edge.

Q. What is the significance of that?

A. Showing the plate edge has not been disturbed from the time it was sheared.

Q. How about the seam on the outside of this exhibit?

A. The same remarks apply to that too. Looking at the outside of the plate with the red letters "4 B" up, just immediately or slightly to the left over No. 1 rivet from the side, there is evidence there of a slight slip of the shearing blade on the edge of the plate—you can see that quite definitely.

Q. What is the significance of that?

A. It shows the shearing marks are still there as originally. The edge of that plate has not been disturbed by any other tool since.

Q. Is there any evidence of the use of a caulking tool anywhere throughout that seam?

A. No, sir.

Q. I refer to Exhibit 160, and ask you to examine the seam on the outside of that plate, and tell me what you observe with respect to possible caulking.

A. My observation as to the caulking is the same as to the previous exhibit, except I don't see any depression—I can still see the shearing blade marks in places, but there is no mark whatsoever indicating any caulking of any kind. I am quite satisfied that that plate has never been caulked.

Q. I call your attention, in the way of the seventh and eighth rivets from the righthand side of the plate, held with the "160" up, and ask you to examine the condition of the edge of the upper plate nearest to the lower plate and tell me what you see there—when I speak of the upper plate I speak of the plate that is on top of the lower plate.

A. That is the edge of the plate that is adjacent to the heads of the rivets?

Q. Yes, on the underside which comes in contact with the plate that is beneath the other—what do you observe there?

A. I don't quite know what you want to know, Mr. Matteson—I think I have already given testimony as to this bad shearing.

Q. I want to know if there is any evidence of caulking there.

A. No, there is no evidence of any caulking there, none whatsoever. That part you refer to now, incidentally, is where we saw actual beads of water coming out, as I have already given reference to.

Q. I would like to have you examine the reverse side of this plate at the seam, and tell me what you observe with respect to possible caulking there.

A. The edge of the inside plate is badly corroded, but looking at the plate with the edge upward, there is still evidence, between the fourth and fifth rivets—

Q. From the righthand side?

A. From the righthand side. (Continuing) of shearing blade marks, but generally speaking the whole edge is more corroded than the others you have shown me, but I am satisfied there was no caulking there at any time.

Q. Now, I ask you to examine Exhibit 159, the seam on both sides, and tell me what you observe with respect to caulking.

A. Looking from the inside of the tank, the shear blade marks are quite evident, and there is no evidence of any caulking at any time.

Q. Now, will you examine the outside of the plate as far as you can?

A. The outside plate—the whole plate?

Q. No the outside seam.

A. Looking from outside of the tank on the seam, I think the tinning and the solder would prevent me definitely saying there was no caulking there, it is not possible to examine this seam on account of the tinning and the soldering. If I could scrape away part of that tinning—if I could get down to the steel—

Q. Can you do that in a small area?

A. Would it be all right if I do that one end (scraping). I will confine the scraping to a very small area. It is difficult to get this tinning off, I don't think it is possible to get it all off with a knife, but in my opinion this plate has not been caulked. Using the point of the knife to get right down to the metal, it is just as hard on the inside of the edge as the outside, and I am satisfied that that plate has not been caulked in the part that I have scraped.

Q. I call your attention to Exhibit 158, and ask you what you can tell us with respect to the inner and outer seams with respect to caulking.

A. Taking the outer seam, this plate has never been caulked, and it is impossible to caulk it; it can never be caulked.

Q. Why?

A. Because the gap between the inner edge of the outside plate and the crown plate is far too wide to caulk it, you would ruin the plate if you attempted to caulk that. You would have to definitely split the plate down for a considerable depth in order to get any metal over, and then you would have to weld up that split so it would be hopeless to caulk. It wouldn't be possible to caulk that seam in a satisfactory manner; the job would be worse afterwards.

Q. How about the interior seam?

A. Impossible to caulk that, due to its condition. It is frightfully bad workmanship here on the inside, and it would be absolutely impossible to caulk that plate without chipping it to get a fair surface first, or to have it machined. Originally, I think the crowns would be machined on their lower edge, but from observing this exhibit, the crowns were merely sheared, and there is evidence, as I have already stated, of very bad shearing in this exhibit.

Q. Who do you say it was only sheared?

A. It is obvious from the appearance of the seam—the edge of the plate itself.

Q. And what in particular do you call attention to?

A. The unevenness of the whole line, and furthermore the presence of a mistake on the part of the shearer, inasmuch as he allowed the shear blade to go off the line to a very considerable extent, and slice into the seam—into the plate—leaving, as you can see, a jagged piece of metal showing.

Q. I call your attention to Exhibit No. 6-A, and ask you to tell us whether that has been caulked or not.

A. Owing to the presence of solder at the lower edge of the plate, I can only judge this from the end of the plate itself, and I am satisfied that plate was never caulked.

Q. Did you examine both ends?

A. I did, examine both ends, yes—I had previously examined all these very carefully.

Q. I ask you the same thing with respect to Exhibit 5-Z.

A. It is very clear from the one end of this exhibit—I don't know what end you would call that—the end to the right of 5-Z—looking at 5-Z, to the right of those letters—it is evident that that plate has never been caulked.

Q. Have you examined the other end?

A. Yes, I did, but it is much clearer on this one end that I mentioned.

Q. I show you Exhibit 5-Y, and ask you the same thing.

A. It is evident from both ends of this plate that this plate has never been caulked.

Q. I show you Exhibit 5-X, and ask you the same thing.

A. Here we have a very good example, showing that the plate was not caulked. The edge of the crown—the lower crown plate—has been sheared at a considerable angle away from a square—that is from 90 degrees—and it is very evident from the end—to the left of the letters "5-X"—that this plate has not been caulked. It is also evident from the other end that the plate has not been caulked.

Q. I show you this Exhibit 163, and ask you to tell me what that is.

A. That is a caulking tool for an air caulker machine, but it is rather longer than most hand caulkers, but it otherwise is quite similar, except that a hand caulking tool would be of the same diameter towards the top, whereas this has been reduced to fit the machine.

Q. Is this the usual type of caulking tool, as far as the cutting end is concerned?

A. As far as the cutting end is concerned, it is quite usual. You will notice at the caulking end there is not only a slight taper away from the upright or from the square, but it is also rounded, which enables the caulker to use the slightly rolling motion that I have already mentioned.

Q. The rounded surface is from side to side?

A. From side to side, yes, that is to prevent, in a way, the caulker from applying too heavy a load on the edge of the caulking tool and giving a bad joint in the trench, or appearance in the trench.

Q. What is the trench?

A. The trench is the depression below the top of the plate formed by the caulking tool, which is shown in that Exhibit 164.

Q. There has been some testimony with respect to soldering, Mr. Thompson, and there has been some testimony that there were evidences, consisting of bits of solder or other traces left in the seams of some of these tanks. Did you examine the tanks for the purpose of determining whether there were any such evidences or not?

A. Yes, I examined them very carefully for that very purpose.

Q. And what did you find?

A. I could find none.

Q. To what extent did you find evidences of solder on the tank?

A. Well, on the Nos. 1, 2 and 4, the tanks were soldered at the side seams for a length of approximately eighteen inches to two feet, and on 1, 2, 3 and 4 they were all soldered on the lower circumferential seam.

Q. Did you examine tank No. 3?

A. I examined tank No. 3, yes.

Q. Were there any evidences or traces of solder in the side seams of that tank?

A. Not in that tank, no, sir.

Q. I ask you to examine this Exhibit No. 160, the outer seam, and ask you if there is any evidence of solder there?

A. No, sir.

Q. What would you expect to find as evidence of solder, if solder had been there?

A. Oh, I think there would be—supposing the heat had been hot enough to remove the tinning—I think you would find acid marks without question. I don't think myself it is possible to remove all traces of tinning in any fire which would leave the plates in anything like the condition that they now are. I think you have that shown very clearly on another exhibit. I think it is 159—where at the end—each end of that exhibit—and running in both cases right up to the edge of the plate, you have the tinning adjacent to where a very fierce heat had been applied by the oxyacetylene torch, which was used for cutting this sample out.

Q. How much heat is represented by the cutting operation?

A. I have never actually tested it, but I know it is considerably in excess of the melting point of steel, and I heard two witnesses say 3000, and in my opinion it would be quite considerably in excess of that. I think the melting point of steel is slightly lower than 3000, and I know the way this metal flows when the oxygen is blown through the melting point at the edge of the plate, that is considerably in excess of the melting point of steel.

Q. Referring to Exhibit 158, there has been testimony that that seam on the outside at the top of the tank had been soldered, that possibly the solder had been reduced to powder by the heat of the fire and dissipated by action of the elements. What is your opinion with respect to that?

A. I don't think that is correct, Mr. Matteson. I am perfectly satisfied there has been no solder in that joint at any time.

Q. Why do you say that?

A. Because I would expect either some remains of tinning or mark of acids. I see no trace of acid there at all. The condition of the plate seems to be the same more or less all over; there is no acid line, there is no tinning line, and the seam itself seems to be as badly corroded inside, where I can see it in between the plates, as it does in any other part of the plate.

Q. What does that indicate?

A. I think if we had soldered there we would have indications of either tinning—if you didn't have part of the solder left in the plate—I think if solder had been there it would have run down part into the seam itself, and there is no trace of solder at all there.

Q. You were speaking of acid marks. Referring to Exhibit 160, do you see any signs of any acid marks there?

A. No, sir. It is true there is an appearance of a marking which extends out from the edge of the plate to a distance of probably an inch and a half in places, but I do not consider that an acid mark.

Q. Can you determine what that is?

A. I couldn't say definitely, it may be that those tanks were soaped along the edge at one time, in order to test the tightness of the tanks, and it is possible that that mark is left there, maybe, from the fact of the alkalies in the soap, I don't know. I am satisfied there is not an acid mark as we use for cleaning the plate.

Q. Since you were testifying last, Mr. Thompson, I think these rivets, or the remains of rivets constituting Pilkington Exhibit 17, have been marked in evidence. Have you examined those?

A. Yes, I have examined these carefully on several occasions.

Q. What do you observe with respect to them?

A. They have apparently partly drilled and partly burned them out of the tank, and from the appearance of the shank relative to the head, I am satisfied that these came out of unfair holes—holes that probably had been drifted. That is the evidence on the rivets themselves.

Q. What do you observe that indicates that?

A. As I say, the angle of the shank to the head shows that they have been driven in at an angle varying from a pure right angle, which they should normally have been driven in at—that the rivet has been strained, consequently. Furthermore, there is evidence underneath the heads of the rivets of what I call considerable corrosion showing that the joint at that head was not gas tight at the time it was taken out.

Q. How would the corrosion affect that—the corrosion that you see there?

A. The corrosion would cause the joint between the head of the rivet and the plate to become other than tight.

Q. Why?

A. Because it has space through which gasoline can pass.

Q. What makes it?

A. You will notice that the underside of the head of the rivet is pitted, thereby forming passages for gasoline to pass underneath the head and down the shank of the rivet.

Q. Can you illustrate what you mean by an unfair hole?

A. Yes, I have prepared a sketch here (producing same). It has been considerably enlarged in scale in order

to make the matter clear. This sketch is marked diagram A. Now, on the top of the diagram there is a sub-diagram—the mark No. 1—indicating two plates in section and showing the rivet holes in proper alignment.

Q. That is what you call a fair hole?

A. That is what I call fair holes. On sub-diagram 2 immediately below it: On the upper part of this is a plan view of those two holes showing as one complete circle. On the lower part of the same diagram, sub-diagram 3, there is a cross section through two plates, showing unfair holes, and immediately above it, in plan, you will see two circles showing the overlap of one plate, the extent of the overlap is shown in this plan marked in red. On the lefthand side of the diagram, in figure 4, there is indicated what is known as a snaphead swell neck rivet. Good practice in ship work and tank work generally is to employ the panhead rivet with swell neck, as shown in sub-diagram 6. This diagram also shows this panhead rivet riveted into a countersunk hole, which is the usual practice in watertight and oiltight work.

Q. Is that the type of rivet that is used in Exhibit 164?

A. In as far as the riveted head is, but not as far as the original snaphead of the rivet. That exhibit has the points hammered down into countersunk holes as shown in the sub-diagram 6 I have just referred to. In sub-diagram 5, there is shown a plain neck snaphead rivet, which is the type of rivet used in the tanks of the Seminole.

Mr. Matteson:

I offer the diagram in evidence.

It is marked Libelants' Exhibit 165.

Q. Can you illustrate for us how the rivet is driven in an unfair hole?

A. Yes, I have a further diagram here which I call diagram B. Here again the scale is enlarged to make the

illustration clear. Under figure 1 of diagram B there is shown a drift in two positions: First, at the start of the drive—that is, immediately the drift is put into the unfair holes. That drift consists of a piece of round tool steel tapered towards its lower end, and with a head at the top. That drift is driven by force into the two holes, and the time it reaches well in, it distorts the upper hole in the diagram of the left side and the lower hole of the diagram to the right side to the extent as shown in red. In figure 2 of diagram B I have indicated a rivet inserted in such distorted holes, showing the shank of the rivet at an angle greater than 90 degrees, a normal angle of a shank to a head, and riveted on the outside I have given here the most favorable condition that this rivet could be inserted, inasmuch as I have completely covered the open space in the lower plate by the riveted head or point of the rivet, but this sketch indicates what is left in the hole—that is the spaces left in the two holes, not filled by the rivet. The tightness of such a rivet will depend entirely upon the surface of the underside of the head of the rivet marked "A-A"; and the upper side, or the inside of the riveted head marked "B-B", and if you use such a rivet even with a caulked plate, that is caulked on the outside, you are liable to get seepage from inside of the tank, passing into those spaces left in the distorted holes, and if the riveted head or point of the rivet is not thoroughly brought home to the plate you will get seepage past the shank of the rivet. And in figure 3 of diagram B I have shown the effect of a slack head on such a rivet. It will be noted you get a seepage point under the rivet communicating with the space left in the distorted holes.

Mr. Matteson:

I offer the diagram in evidence,

It is marked Libelants' Exhibit 166.

Q. You spoke of the impossibility of caulking a seam such as is shown on Exhibit 158. Can you illustrate that to us?

A. Yes, I prepared another rough diagram here, which I call diagram E. On the lower part of this diagram in figure 4 is shown a crown such as we have in Exhibit 158—that is where the side plate extends upwards beyond the point where the crown leaves the side plate. It indicates the space between the crown plate and the side plate, and shows the impossibility of that particular joint being caulked. On figure 5 of diagram E, I show the proper way of fitting a crown plate to a side plate. It will be noted that in this case the straight part of the flange of the crown extends up and slightly beyond the top of the side plating. That is a type of joint that we can caulk, and that is standard practice—the type shown in figure 5 is standard practice.

Q. There has been some testimony, Mr. Thompson, with respect to the lap seam at the top of the tank where the overlap of the plates join the crown. Can you illustrate to us the condition you observed there?

A. Yes, on the same diagram E, in figure 1, is shown one method of dealing with what we call the jointer rivet. That jointer rivet has to go through three thicknesses, and is known as a three-ply joint. You can do that satisfactorily in two ways: First, as shown in figure 1, where there is a joggle plated lap seam, and in figure 2 is another satisfactory way of doing it, where we have a plain lap seam, but where in the tank's side plating—I will mark that "tank side"—the outer edge at the top of that plate is thinned out in a fire until it becomes a knife edge. That fills up the space between the other tank side plate and the lap of the crown plate and leaves a condition which can be caulked or dealt with. In figure 3 of diagram E, I show the condition which I found in the tanks of the Seminole, whereby it can be seen—at least whereby I notice—that the tank's side plate had not been properly

thinned out in the way of the jointer rivet, and left a gap which can be noted in one of the photographs, because I had a photograph taken showing the insertion of the knife at that particular point. (Referring to Libelants' Exhibit 152) the knife here shows clearly the jointer rivet, because I observed that the space extended beyond—the space I have already referred to, that is the space between the improperly thinned side plate adjacent to the jointer rivet—that space could not have been caulked even if the crown had been built in a proper way, as shown in figure 5 of diagram E. So, in my opinion, this crown plate shows very bad workmanship, not only in regard to the way in which the crown plate itself was fitted to the side plating, but also in regard to the way the jointer rivet was fitted.

Mr. Matteson:

I offer the diagram in evidence.

It is marked Libelants' Exhibit 167.

Q. Referring back to Exhibit 160, there has been some suggestion in the testimony that the conditions now observed, both with respect to the seam and the side plate there shown, may be accounted for by the fact that this tank was exposed to fire. Will you tell us what your opinion is with respect to that?

A. Well, I formed that opinion apart from these exhibits—I formed my opinion from the appearance of the tanks themselves.

Q. Will you tell us what you observed?

A. What I observed from the whole tanks: I saw no distortion whatsoever in those tanks as a result of any fire they may have been subjected to.

Q. Referring particularly to this exhibit, do you find any evidence of distortion there?

A. No, sir. I may say, Mr. Matteson, that if a fire of anything like the nature one could expect at the ware-

house, from conditions such as the Seminole went under, could distort a tank of this structural strength, we would be unable to fit steam superheaters for water-tube boilers. There they are subjected to heat much in excess of what one could expect from such a fire, as we had in the Seminole, and those superheater tanks have no water in them at all, they have to stand up to heat conditions much in excess of the fire on the Seminole, and have to stand up to that for years on end. Most superheaters we get temperatures of steam rising up to 800 degrees and above that.

Q. Referring to Exhibit 6-A, there has been some suggestion that there is a distortion in the piece of side plate there shown that might be accounted for by fire.

A. There is distortion there, but that is due to poor workmanship at the start.

Q. In what respect?

A. Well, when this shell was rolled—I am referring to the shell as the vertical plates of the tank—the orifice at the bottom was slightly less than the outside diameter of the lower crown, and it had to be forced over to a certain extent to get the crown in—that is the distortion there—that is a manufacture distortion—you see that quite plainly on the edge of the plate without looking at the flat of the plate—you will notice that the angle is quite different. That is a distortion due to manufacture, which is not unusual, and I don't think very detrimental to a tank itself. I am not criticising the tank on account of the distortion, I am just merely stating what in my opinion is the cause of that slight distortion. That incidentally illustrates why it would be impracticable to caulk the inside of the tank—that is the side seams and the top seam—before the lower crown had been inserted, because those tanks have no manholes, you have to have an inverted end in order to complete the riveting, but if you attempted to caulk the inside edges of a plate of this character, the liability of such distortion would open up the

caulking again in the side seams and the caulking would be gone. I haven't taken any notice of the fact that there is still some soldering remaining in the lower seam, about an inch or an inch and a half away from that alleged distortion—and if the heat had been great enough to distort the plate there, I am quite certain that solder would have run to the bottom.

Q. There has been some suggestion that an explosion and fire, such as occurred on the Seminole, might have been due to kerosene—what is your opinion with respect to that?

A. Well, I don't know what the temperature conditions were at the time just prior to the fire, but I have never had a kerosene explosion case, not in the whole of my career. I have never heard of a kerosene explosion under conditions such as we had in the Seminole, but I do not think it is possible that that was a kerosene explosion.

Q. You spoke of a correction that you wanted to make in your testimony: What was that with respect to?

A. That was something I mentioned. I haven't found that by going through the testimony, but it occurred to me, when doing one of these sketches one day—I have a sketch here which I was preparing for another purpose—and then it occurred to me that I had been working under a misapprehension as to the molded depth of this boat. I took the figure as given, I believe in some paper or other—I think Mr. Bernard's report—that this boat had a molded depth of something between six and seven feet, I believe—I haven't looked up the figure—but this boat only had a depth of not exceeding four feet. The molded depth of a boat is taken from the top of the keel—whether it is the bow keel or a flat plate keel to the underside of the deck stringer plate. Well, I find this boat has a molded depth of something less than four feet, and the remarks I passed as to her liability to weave or move, due to action of the engines or water outside of the boat, or both, the liability would be much greater with this molded

depth of something under four feet, to what I originally thought the boat had.

Q. Can you illustrate what you mean by the molded depth?

A. The molded depth—that is the lower part—that is the top of the keel I mark “top keel”, and the deck stringer is shown on this diagram marked “deck stringer”, so the molded depth of this boat will be from a point I now mark on the starboard side to the bottom of the boat. I will mark two arrows and call that “molded depth”. That dimension, as I said, is something less than four feet. If we assume it to be four feet, on a length of 110, she has then depth to length proportions of 1 to 27.5. I have never built a boat of those proportions without using, from fore to aft, trussing for the full molded depth of the boat. In my opinion she would be very subject to movement in the hull, in any seaway at all and also when under motion from the engines.

Q. What would be the effect of that?

A. The effect of motion?

Q. Yes.

A. I think that would create another hazard on the piping joints.

Q. In what respect?

A. That the motion or vibration—call it what you will, we generally call all those motions vibrations in ship-building—would have the effect, in my opinion, of breaking the joints or making them non gastight, particularly those air-tight joints in the top of the tank, as those joints could not be gotten at to be seen or adjusted—that is to be made tight.

Q. Why could they not be gotten at?

A. Well, they could be gotten at if you removed the deckhousing or the deck above, but I mean a normal inspection of the boat, it is impossible to get at them because those tanks are naturally closed on the top, bottom and ends.

Q. Does your diagram illustrate the position of the housing above?

A. Approximately, it does.

Mr. Matteson:

I offer the diagram in evidence.

It is marked Libelants' Exhibit 168.

Q. Is this diagram you have drawn intended to be to scale?

A. Approximately—all free-hand sketches—but I use the scale in connection with them. Obviously they are not entirely to scale, but I think they are near enough for all practical purposes.

Cross Examination.

By Mr. Underwood:

Q. You did observe solder partway up the side seams of three of the tanks, did you say?

A. Yes, 1, 2 and 4, I think.

Q. And did you see any solder at all in the side seams of No. 3 tank?

A. Not in the side seams—in the bottom seam I did.

Q. Either side seam?

A. No, sir.

Q. Does that photograph, Libelants' Exhibit 139, which is a picture of No. 4 tank, show the solder up the seam?

A. Yes, I should say it does.

Q. Will you indicate on there where the solder stops.

A. I can do it approximately?

Q. Yes.

A. Write it on?

Q. Yes, and if your memory differs from the photograph, will you tell us about it?

A. I am afraid I couldn't give it from memory. I will mark it with an arrow and write "Apparent end of solder".

Q. Mr. Thompson, you notice the difference in the color of the tank in the foreground and in the background?

A. Yes, I do, it is quite noticeable.

Q. And that takes place on a pretty well defined line, doesn't it?

A. Yes, I should say that is pretty well.

Q. And that pretty well defined line is just about the same place as the end of the solder?

A. As the top end of the solder?

Q. Yes.

A. I should think about three inches above the solder there, as far as I can see from the photograph.

Q. A matter of a couple of inches?

A. Two or three inches, yes.

Q. How do you account for that discoloration of the tank—perhaps I should say the difference in the surface condition of the tank above and below that fairly well defined line?

A. I couldn't account for it, I don't know how to give a definite account of that.

Q. In your opinion, is it possible that fire conditions could cause that—the difference in the effect of fire above and below it?

A. No, I wouldn't say that. I am not only giving an opinion from the photograph, I am also giving it from the appearance of the tank itself which I have seen so many times. I formed the opinion—not from this photograph—when I saw the mark on the tank, the difference in the discoloration, I thought that difference was due to probably the fact that the tank had been in water subsequent to the fire for some considerable time.

Q. Did you notice any similar line on No. 3 tank?

A. Yes, my memory—I am speaking from memory—I think all the tanks had more or less that line.

Q. Do you remember whether the corresponding line on No. 3 tank was well defined and approximately parallel to the bottom of the tank, as that line is there (indicating Libelants' Exhibit 139), or whether it was otherwise?

A. Speaking from memory only now, I think they were all more or less the same.

Q. Did you notice any relation between that line we are speaking about on Exhibit 139, and the height of the ash in the bottom of the tank in the tank space?

A. No, sir, I didn't notice that. I wouldn't have taken any—if I had noted it—I wouldn't have placed much reliance on it, because that boat has been under water and I don't know what the ash height might have been at any particular time.

Q. You wouldn't expect any substantial increase in the height of the ashes after the fire once burned out, would you?

A. They might have floated along from other parts—the tide rose and fell—

Q. Do you think it could float into the tank compartment?

A. Well, it had that square opening there, and the tide rose and fell in the boat—it had an opening in the bulkhead—that is the after bulkhead of the tank compartment—which we refer to as the old bunker door, so I didn't place—I didn't think it was worth noting, Mr. Underwood, so I can't say more than that.

Q. Looking at Exhibit 141, you see the same line that you see on Exhibit 139, except you see more of it, isn't that right?

A. That is right. This photograph (Exhibit 141) is an excellent illustration of the fact that that tank is not distorted by heat.

Q. Look at the edge of the upper plate in Exhibit 137—I mean the upper in the same sense that Mr. Matteson used it—the overlapping plate—

A. The edge below the letters "4 B", is that right?

Q. Yes. What is that bright surface?

A. Steel metal.

Q. And along the other end?

A. Steel metal.

Q. Just steel?

A. Yes, that is a metal—actual steel.

Q. Bare steel?

A. Yes, that is not wide enough for solder, that is merely steel—been brushed along there.

Q. When rivets are driven hot, they are soft, aren't they?

A. Yes, they are something, I should think, slightly over cherry red.

Q. Well, they are pretty soft compared with the power of a rivet hammer, aren't they?

A. Depends on what power is exerted.

Q. I don't mean you can squeeze them in your hand.

A. They are ductile with the use of a hammer and moderate pressures.

Q. And when you hammer the riveted head, of course there is a man holding the snap head?

A. Oh, yes.

Q. What is to prevent the metal of the shank of the rivet from being forced into the spaces which you have marked "S" on figure 2 of Exhibit 166?

A. With a hot rivet?

Q. Yes.

A. Partly it could, and then that is a rivet that must be taken out immediately, because there is a rivet then in which you have points where you can get concentration of stress, and that is one of the main reasons why we always refuse to accept rivets in distorted holes.

Q. You mean that you refuse to accept them because the metal of the shank swells up and fills the drifted space such as you have indicated by the lower "S" on figure 2 of Exhibit 166?

A. In the first place it doesn't fill the space.

Q. What prevents it from doing that?

A. In the first place it is not sufficiently hot for that. In order to do that, it would have to be white hot.

Q. It is sufficiently hot so that you can take a plain point and round it over to such a condition as appears, for example, on Exhibit 5-X—it is sufficiently hot to do that, isn't it?

A. You can do that when it is cold riveting.

Q. You can do that with hot riveting all the more easily?

A. On the outside, but you cannot get it sufficiently hot in the shank inside the holes to do that.

Q. It is the same temperature all over, when you start to drive it, isn't it?

A. Yes, but I say you can do this cold.

Q. I am talking about hot rivets.

A. I say definitely that you cannot fill an uneven hole even with a hot rivet.

Q. Of course, I fully appreciate that you say that, I don't expect to get you to change it, but I just want to know why it is that if one end of the shank of the rivet is ductile enough to be hammered into a nice round point, why it is that the balance of the shank is not also sufficiently ductile to be hammered into the space you have marked "2" on Exhibit 166.

A. Because you apply the hammer to the actual point when you are riveting, you are not applying the blow to the shank inside of the hole.

Q. Of course, when you drive a rivet, you are applying the pressure on the end of the shank, aren't you?

A. That is right.

Q. On a line that is in the same plane with the axis of the shank?

A. No, sir, you do nothing of the kind in riveting.

Q. Well, you apply your pressure to the point of the rivet in the direction of the head of the rivet, don't you?

A. Approximately—not in direct line of the head.

Q. And the tendency of pressure in that direction is to shorten the rivet, isn't that right?

A. The tendency is to—well, if riveting is applied in that way, hot, it would be a frightfully poor way of riveting, your plates are supposed to be draw right up tight first, and in my opinion you do not shorten the shank in riveting.

Q. Well, Mr. Thompson, the tendency of a blow exerted on the point of the rivet, in riveting hot rivets, is to shorten the shank, isn't that so?

A. No, sir, I would not agree.

Q. Doesn't it actually shorten the shank?

A. No, sir.

Q. Isn't a rivet, when driven, shorter than it was when first put in the hole?

A. Yes, because you flatten the head, it is not shortened by the fact that you lengthen the shank—draw the shank—you were talking about drawing the shank.

Q. Let's look at this countersunk rivet here, the diagram at the lower left hand corner of Libelants' Exhibit 165: Of course, before that rivet was driven or heated or pointed, the sides of the shank were fair all the way out to the point, weren't they?

A. That is right, just like that (indicating figure 5).

Q. And that was reduced to that shape by blows on the point of the rivet?

A. That is right.

Q. And that rivet assumed the shape of the countersunk hole, didn't it?

A. It did, yes.

Q. Now, what is there to prevent the rivet illustrated on figure 2 of Exhibit 166, assuming the shape of its hole when hammered hot?

A. Any rivet you mean—a hypothetical case now?

Q. Take that particular rivet that you are looking at on your sketch.

A. That is a large sized rivet, the conditions are entirely different. If you will apply your question to a 5/16 rivet, as used in this tank, the conditions are entirely different. I will have to have the conditions put up to me to answer properly.

Q. Well, assume a 5/16 of an inch—we will assume rivets of the size of these tanks—

A. Those rivets could not have been used hot.

Q. Assuming rivets of that size are driven hot, what is there to prevent them from filling up that space shown in figure 2 on Exhibit 166, just the same as such a rivet would fill up the space shown in the diagram in the lower lefthand corner of Libelants' Exhibit 166?

A. If you could use a hot rivet of that diameter in a hole of the type we are discussing, in the first place you would have to use a considerably longer rivet. If that rivet then was so hot that it would squeeze up into the hole, that rivet would be too hot to pass through the hole, it would be badly injured passing through, and would not be a fit rivet to use.

Q. When you say badly injured, do you mean that it would be gouged out of shape by the unfair hole.

A. By the contact of the hole and the holder-up. It would be impossible for a holder-up to pass a rivet through a hole of that description at that heat without ruining the rivet in attempting to pass it through the hole.

Q. And just how would the rivet be ruined?

A. Because it would be too hot, too soft for the holder-up to apply sufficient pressure to pass it through the hole. You would distort the rivet before it came through.

Q. And what would do the distorting?

A. The force the holder-up applies to the rivet in such a state of heat. Rivets can be too hot in applying and more rivets are ruined by such means than any other way. I know. A rivet that is not hot enough can be dealt with, but a rivet that is too hot is thrown away by the

holder-up, if the rivet boy is foolish enough to pass such a rivet to him.

Q. Just who is the holder-up—what does he do?

A. He holds up the rivets inside of the tank, in this particular case. A riveting squad consists of two riveters, a holder-up, and a rivet boy. The rivet boy holds the rivet, passes the rivet to the holder-up, he forces it through the hole and holds onto the head while the riveters knock down the point.

Q. And what is it that the holder-up would do with such a rivet that will ruin it?

A. Passing it through the hole from inside.

Q. And just how does that ruin the rivet?

A. Because the rivet is too hot, too ductile.

Q. What does that?

A. Touching the edges of the hole would scrape so much of the metal off, and the head of the rivet would be distorted in the act of passing it through the hole, if it were hot enough in order to fill up that space below, as you have indicated. I say, from a long experience of riveting, that that process is impossible, and particularly if you connect that with a rivet so small as 5/16.

Q. Do you say that 5/16 inch rivets cannot be driven hot?

A. It is not good practice to drive them hot.

Q. And do you say these were driven hot or cold?

A. I say they were driven cold, that is my opinion. I was not there, but that is my opinion from the appearance of the rivets (indicating Pilkington Exhibit 17).

Q. Have you made any inquiries to find out where these tanks were made?

A. Yes, I made inquiries.

Q. What did you find out?

A. I asked all around Miami, and finally got to Captain Nelson who installed those tanks, and he refused to tell me, but I heard from other people that Merrill

Stevens of Jacksonville had built the tanks, so I got in touch with Merrill Stevens and they knew nothing about it—they denied too, ever having made or supplied the tanks.

Q. So you came to a dead end?

A. Absolutely, it was.

Q. You have said something about the lap seam at the tops of these tanks, where they should be, as you have said, a knife edge on the under plate. Of course, you wouldn't expect any leakage of liquid gasoline there, unless the tank was full and pressed up?

A. That is right, when the tanks were filled completely up.

Q. Above the level of the filler hole?

A. Above the level of the filler hole. Of course, they could have been filled up above the level of the filling pipe at the tank, because the top end of the filling pipe was well above the tops of the tanks, being on the upper deck.

Q. This diagram that you have made showing the molded depth, I want to ask you a question or two about that Exhibit 168: This deck stringer plate that you referred to—let's see if we can find that on a photograph, that I can be sure I understand what you are talking about.

A. It is the plate underneath the passageway.

Q. I show you Exhibit 10, which shows the port side—not the starboard side—and ask if this plate over here running approximately horizontally is what you referred to as the deck stringer plate?

A. That is right. This shows the port side only—that is not the deck stringer plate here, but I believe it is the same level as the deck stringer plate I referred to on the starboard side (marking same).

Q. I don't know whether you can see it or not on this photograph, Libelants' Exhibit 41, but tell me whether or not you can see that deck stringer plate there.

A. No, but I think you can see the height of it, it is the top of that beam there, it is over here somewhere in the shadow.

Q. Isn't that it here (indicating)?

A. That might be it, yes, that little bit here, but it is the same level, you see.

Q. The same level—

A. As the top of that bulkhead.

Q. As the top of that bar?

A. Yes.

Q. If you think it is a fair way to do it, mark that "deck stringer plate".

A. Shall I put it on the beam?

Q. Yes.

(The witness writes "deck stringer level").

Q. You have drawn an arrow on Libelants' Exhibit 141 to a cross member and written below that "deck stringer level"?

A. That is right.

Q. And would there be a similar cross member—

A. The underside of that deck.

Q. Appears—

A. Where I have the arrow "deck stringer," the same height, it is the level of the longitudinal bulkhead along the passageway.

Q. And if I understood correctly, this diagram is based upon some information which you have had that the distance between the top of the keel and the deck stringer plate is how much?

A. Something less than four feet.

Q. Have you calculated the block coefficient of this hull?

A. No, sir, I estimate it to be somewhere in the neighborhood of .6, but that is merely looking at the boat afloat.

Q. Did I understand you to say that you had never had a case involving a kerosene explosion?

A. That is right, I never had in my thirty odd years of experience. Furthermore, I say I never heard of one in that time. I have heard of kerosene lamps, where temperature has gone up in lamps, but I was referring to boats.

Q. Of course, you know that kerosene will explode?

A. Yes, but with kerosene engines in England we have a constant burning lamp, and the Gardner is the most—those lamps are going regularly in the enginerooms where we have gasoline as fuel, and kerosene pipe lines coming in, and I have had probably more experience with kerosene engines—I am going to make an admission now—than with gasoline engines. I think I have built more kerosene or paraffin engine boats than gasoline.

Q. I don't mean to cut you off, but I don't think that is an answer to my question. I think all I asked you was this: Kerosene will explode, won't it?

A. Oh undoubtedly, I have no doubts about that at all, given the right conditions.

Q. I think you already admitted that you are not a chemist?

A. That is right.

Q. Have you ever performed any tests with kerosene to ascertain at what temperatures they give off a vapor that will explode?

A. No, sir, I haven't, but I think I have a fair idea of the flash point.

Q. Well, what is your fair idea of the flash point?

A. I think it is something over 120.

Q. What do you mean by flash point?

A. Well, flash point—I am not a chemist, I have never carried out any flash point experiments—flash point, I believe, is the temperature at which under one or the other of the various flash point experiments, each I be-

lieve involving a closed cup test, giving the temperature at which the liquid will give off an explosive gas.

Q. This closed cup test is something that is performed with some delicate chemical apparatus, isn't that right?

A. I believe it is, I have never been present at one, so I haven't much information on that actually.

Q. Do you know there is such a thing as an open cup test for flash point?

A. No, sir, I understood they were a special form of closed cup they carry them on with, but you may be right.

Q. You don't know whether there is such a thing as an open cup test for flash point, or not, do you?

A. No, I have never been present and concerned with those tests.

Q. Do you know what the apparatus is—the cup apparatus?

A. No, sir.

Q. You expressed the opinion that this was not a paraffin explosion, I take it from what you say that the basis for that opinion is that you have never seen one or heard one, is that right?

A. Yes, in spite of the large experience with vessels burning kerosene as fuel, I think that would be a fair answer to you.

Re-Direct Examination.

By Mr. Matteson:

Q. Mr. Thompson, one of the questions that you were asked with respect to the molded depth was with reference to information which you had received. What is the information on which you estimated the molded depth of the Seminole?

A. Oh, I didn't receive any information from anyone else. I really meant to imply that it had come to my

memory, going over the case, that I made a mistake in molded depth, and I took the measurement given in the report as the molded depth, and it suddenly occurred to me that that was wrong.

Q. What I mean is: What is the information on which you have calculated it now?

A. From measurements I actually made on the ship. It was inadvertent on my part not to mention it before, and I frankly overlooked it, and I was misled to that degree.

Re-Cross Examination.

By Mr. Underwood:

Q. Let me see if I understand you now, Mr. Thompson: Nobody else told you that the molded depth was four feet?

A. No, sir.

Q. You made some measurements on the vessel and you calculated that her molded depth was four feet, is that right?

A. Well, actually I know from measurements I took, it is a little lower than $46\frac{1}{2}$ inches from the depth of the keel to the outlet of the tanks, I know it is less than that. I said four feet—it is actually less than $45\frac{1}{2}$ inches.

Q. From your measurements, you have calculated that the molded depth of the Seminole amidships is something less than 45 inches?

A. $45\frac{1}{2}$ inches, that is the measurement I took, and I know the molded depth is less than that, and that figure was agreed with Mr. Munroe at that time—that $45\frac{1}{2}$ —at least I think it agrees with this figure. That could be easily checked up on the vessel now.

Q. I have forgotten what you testified before as to whether this vessel had a flat keel or a bow keel.

A. I said before I didn't know, I hadn't seen the bottom of the boat. That was some time previously I mentioned that. I think you asked me the question.

Q. And you don't know now?

A. I don't know now, I haven't seen the bottom of this boat.

Q. Perhaps what I am thinking of is when you drew this sketch, Libelants' Exhibit 148, you drew a flat keel.

A. I assumed for a shallow-draft vessel she would have a flat keel.

Q. You assumed that?

A. I assumed that.

On June 5th, 1941, the Court filed its Findings of Fact and Conclusions of Law, which is in words and figures as follows:

4795 FINDINGS OF FACT AND CONCLUSIONS OF LAW.

(Title Omitted.)

1. On June 24, 1935, an explosion and fire occurred on the houseboat Seminole, then lying in dead storage in the yacht storage basin and under the shed of respondent Pilkington, at Fort Lauderdale, Florida. The fire was communicated to other vessels similarly situated, some of which were consumed, and some of which were damaged by the fire which likewise destroyed Pilkington's shed.

2. Prior to February, 1915, the Seminole had been owned by H. C. Phipps, a brother of respondent Phipps. In February, 1915, respondent Phipps bought from his brother a one-half interest in the Seminole. Prior to 1922

she was propelled by steam, but in that year her steam plant was removed and gasoline engines and their necessary appurtenances were installed. In 1927-1928 she was largely rebuilt at the Merrill-Stevens yard at Miami, many of her bottom and side plates being renewed, her electric wiring placed in conduit or wire mold at a total cost of about Thirty-seven Thousand (\$37,000) Dollars.

3. In late 1928 or early 1929 H. C. Phipps and the respondent, J. S. Phipps, each sold his one-half interest in the Seminole to the Seminole Boat Company, a Delaware corporation, which had been formed for the purpose of taking title to the Seminole and operating her under charter for hire. H. C. Phipps and respondent Phipps each received one-half of the outstanding stock of the Seminole Boat Company in payment for his half interest in the vessel. The Seminole Boat Company promptly made a contract with William P. Baker, an experienced master of charter boats, well-known in the charter business, to operate the Seminole under charter for hire and in 1929 and 1930 she was so chartered on several occasions. Thereafter, while she was always available in the charter market, she was too big and too expensive to operate during the depression years, and no charterer was actually found for her after 1930.

4. From the beginning and down to and including the time of the fire the directors and officers of the corporation were Paul Scott, R. C. Alley and Roy H. Hawkins, who were, respectively, President, Vice-President and Secretary-Treasurer. These men, as officers of the corporation, assisted by James F. Riley, and advised by Captain Baker and other boat captains, operated, controlled, maintained, and managed the vessel from the time of her purchase by the corporation down to and including the time of the fire.

5. In February, 1935, Hawkins, upon his own initiative, decided to remove the Seminole from dead storage at Pilkington's basin where she had been most of the time since 1930, and to bring her to Miami, put her in commission and offer her for charter or for sale. No charterer could be found, and the only offer to purchase was for an amount considered too small by at least one of the stockholders, respondent Phipps. The other stockholder, H. C. Phipps, on March 23, 1935, sold his stock in the corporation, one-half the outstanding stock, to Mrs. Amy Guest, his and respondent Phipp's sister. From that time on down to and including the time of the fire, the stock of the Seminole Boat Company was owned one-half by Mrs. Guest and one-half by respondent Phipps. No change in the operation, control, maintenance or management of the vessel occurred, nor in the official personnel of the corporation.

6. In April, 1935, when the charter season was over and no charterer had been found, the two stockholders, Mrs. Guest and respondent Phipps, and members of their family and friends went on a fishing trip in the Seminole to the Florida Keys. The crew was hired by Hawkins, except for the engineer and one sailor who were procured by Riley. On this occasion the operating expenses of the Seminole were voluntarily assumed and paid by respondent Phipps, but the expenses of the maintenance of the vessel on this occasion, and at all times following the sale to the corporation, were borne by the Seminole Boat Company, its deficits being made good in equal shares by the stockholders.

7. The cruise ended at Lower Matecumbe where respondent Phipps, Mrs. Guest, and the entire party left the vessel. Hawkins instructed the master to take the vessel to Miami and thence to respondent Pilkington's for

storage. She arrived and was left at Pilkington's pier outside his shed on April 15, 1935, having been prepared for lay up there by her crew upon the instructions of Hawkins and without any instructions from respondent Phipps, who was not present and took no part in such preparation.

8. On June 24, 1935, Riley arranged for R. C. Abel, who was Captain of Phipps' fishing boat "Clip", and sometimes of his boat "Iolanthe" to proceed to the Seminole on behalf of the Seminole Boat Company, and there to pay to Pilkington a small balance due from the Seminole Boat Company to Pilkington on account of storage charges, to inspect the Seminole, and to bring back certain property belonging to the Seminole Boat Company. Abel was accompanied by John Thomas, with whom a contract had been made to make a piece of rope work for a vessel owned by respondent Phipps, Thomas to use a similar piece of rope work on the Seminole as his pattern. He and Thomas proceeded to Pilkington's basin where Abel obtained from Pilkington the keys to the Seminole, after which he and Thomas boarded the Seminole. After Thomas had finished his inspection of the rope work which was to serve as his pattern, Abel and Thomas gained access to the interior of the vessel by means of the keys given to Abel by Pilkington, and, after inspecting the spaces abaft the engine room, proceeded to the starboard engine room window between the engine room and the fore and aft alleyway. There Abel entered the engine room and proceeded directly aft to the switchboard, Thomas remaining in the alleyway at the window.

9. Abel lit a match to obtain light so that he might see the labels on the switches. He manipulated three to five switches, at or near one of which a spark occurred. Following all of this the explosion occurred, which was followed by the fire and general conflagration.

10. A day or two after the fire, a diver found the four gasoline tank valves wide open, and the two valves on the gasoline drain line, open one-third of a turn.

11. The contract pursuant to which the Seminole was left with and received by respondent Pilkington, was neither in writing nor oral, but implied, and the only parties to it were respondent Pilkington on the one hand and the Seminole Boat Company on the other. It contained no warranty or representation as to the condition of the Seminole, and Pilkington did not rely upon any warranty or representation, but rather relied upon his own familiarity with the vessel over a period of seven (7) years, when she had been stored with him on other occasions, both by her present and former owners, and his frequent inspections of her.

12. The Seminole Boat Company was incorporated in good faith for the *bona fide* purpose of taking title to the Seminole, and operating her in the charter business, and long prior to June 24, 1935. While it made no profits and no charters after 1930, it continued in existence as a *bona fide* corporation, and there is no fraud or other reason to disregard the corporate entity, pierce the corporate veil, or regard it as an agent of either of its stockholders. It stands as a non-conductor between the libelants and Pilkington on the one hand, and the stockholders on the other.

Discussion.

This case has been very thoroughly presented, in the introduction of evidence, in the interrogation of witnesses, and by careful, painstaking, and exhaustive arguments, impelling me to discuss somewhat in detail the questions of liability, proximate cause, and limitation of liability, and not content myself with the conclusion reached that

respondent Phipps is not liable. The organization of the corporation, Seminole Boat Company, was a natural, normal development of ownership of a pleasure yacht, free from any fraud or ulterior motive in the inception of its chartering and creation. Likewise, it was free of any of the other elements, treated in the reported and cited cases incident to the presence of bad faith, which apply the doctrine of piercing the corporate veil. Furthermore, the character of the negligence which this record discloses is the failure to do or perform a duty, or nonfeasance. Such failure of duty does not give rise to an application of the alter ego or agency doctrine. I can well conceive of cases where a positive wrong, an act of positive negligence, may lead to individual liability of a stockholder in a corporately owned offending vessel, but this is not such a case.

The presence of gasoline fumes in the engine room, I find was the proximate cause of the damage done to the vessels of libelants. Abel was the instrumentality which brought this defective condition into an active element proximately causing the damage, but Abel's acts were not the proximate cause. It is immaterial whether Abel was the agent of Phipps or Seminole Boat Company; his acts or conduct were not the proximate cause of the damage suffered.

The Seminole Boat Company was responsible for the proximate cause. It was not negligence to have converted a steam yacht into a gasoline propelled vessel, and from the evidence it is clear there was no negligence in the original installation of the tanks which were used on the Seminole for gasoline storage. But with the passage of time some part of the machinery or equipment did leak and the great possibility of damage attendant upon the use of gasoline, brings into play the principle that negligence may be based upon circumstantial evidence alone. The respondent argues that there must have been some third

person agency intervening which brought about the means whereby gasoline escaped with attendant fumes. There is no evidence of this, and we get into the realm of conjecture. Just when the defective condition of the tanks made them leaky is in doubt. Expert testimony on this is an unsatisfactory character of evidence. I am satisfied, and find, that there were gasoline fumes present in the engine room, and that their ignition into combustion and fire caused the damage. For this the Seminole Boat Company was liable. Whether the Seminole Boat Company could limit liability is not necessary to decide. That is not in the case.

As to Pilkington, he owed certain duties to libelants as owners storing their vessels with him as a warehouseman, and with his duty of inspection he may be criticized for not having detected and avoided the gaseous fumes on the Seminole, but I do not find that his dereliction in that regard was sufficient on which to base liability.

As to respondent Phipps, he is not chargeable with the negligence, the proximate cause of the damage. For two reasons is this so. Firstly, because the negligence was that of the Seminole Boat Company and not of Phipps; and, secondly, he was without privity or knowledge, even though he should be considered as owner. The character of negligence shown by this record was such that Phipps, as an individual, would not be precluded from asserting as a limitation of liability under the statute. This limitation of liability is provided for by 46 U. S. C. A. Sec. 183, which is derived from Act of March 3, 1851, Section 9. of Ch. 43, 9 Stat. 635. Libelants insist that the six months limitation enacted June 5, 1936, is applicable, with which contention I do not agree. The said six months limitation is a part of a substituted Section 4285 of the Revised Statutes (46 U. S. C. A. 185) and not Section 4283 Revised Statutes, which is 46 U. S. C. A. 183. Section 185 deals with voluntary action taken by an owner deposit-

ing the value of his interest in the vessel in Court, while a limitation defense pleaded in an answer is provided for in said Section 183.

Conclusions Of Law.

1. There was no negligence on the part of respondent Phipps or any person for whose acts or omissions he is responsible.

2. Seminole Boat Company, a Delaware corporation, was at all pertinent times a *bona fide* corporation, a valid creature of the law, not to be regarded as sham or fiction, or Phipps' agent, but as a legal non-conductor between Phipps on the one hand and libelants and Pilkington on the other, because there was no fraud or other improper conduct or purpose in the creation or continued existence of the corporation.

3. The Seminole was owned, operated, controlled and maintained by Seminole Boat Company, not respondent Phipps, and respondent Phipps is not liable for any acts or omissions of the Seminole Boat Company, or any persons who acted on its behalf.

4. Respondent Phipps was without privity or knowledge of the events that led up to and brought about the explosion and fire, and if corporate liability be disregarded, which in my opinion should not be, Phipps would be entitled to limit his liability to the value of his interest in the wreck of the Seminole after the fire under the Limitation of Liability statutes.

5. Respondent Phipps is not liable to the libelants, or to Pilkington.

6. Respondent Pilkington is not liable to the libelants.

Final judgment should be submitted in accordance herewith, on notice to all counsel.

(Signed) JOHN W. HOLLAND,
United States District Judge.

At Miami, Florida, this 5th day of June, 1941.

On June 19th, 1941, an Order of Court was filed correcting the Findings of Fact and Conclusions of Law filed June 5th, 1941, which is in words and figures as follows:

4803

ORDER.

(Title Omitted.)

On this day, June 19, 1941, when the final decree was being considered by the Court, it was made to appear to the Court that in the findings of fact and conclusions of law, in finding of fact numbered 12, and in the fourth line thereof, the year 1940 was stated when it was intended to state the year 1930; and the Court having marginally made said correction in the original of said finding; and the Court desiring that said marginal amendment appear in the minutes of the Court;

It is now Ordered that the said marginal amendment as made be, and the same is hereby, ratified and confirmed.

Done and Ordered at Miami, Florida, this 19th day of June, 1941.

(Signed) JOHN W. HOLLAND,
United States District Judge.

On June 19th, 1941, the Court entered and filed its Final Decree dismissing the Libel, which is in words and figures as follows, to-wit:

FINAL DECREE:

(Title Omitted.)

This cause having duly come on to be heard upon the pleadings and proofs of the respective parties and having been argued and submitted by the respective advocates, and the Court, after due deliberation, having on June 3, 1941 rendered its decision and filed its findings of fact and conclusions of law directing that the libel herein be dismissed with costs against both the respondents and that the petition of respondent Pillington against respondent Phipps be dismissed, and respondent Phipps' costs having been duly taxed by the Clerk at the sum of \$1737.41.

Now, on motion of R. C. Alley, Leftin, Calkins, Anderson & Scott and Burlingham, Veeder, Clark & Hupper, proctors for respondent Phipps, it is

Ordered, Adjudged and Decreed that the libel herein be, and the same hereby is, dismissed with costs as against both respondents, and that respondent Phipps recover of and from libelants Charles Coryell, Julien J. Marks, J. Frank Guyton, J. M. Frere, Frank Vogt, William A. and Dorothy M. Casidy, Leon Sigman, Albertis C. Taylor, Gertrude Brandt Orthwein, executrix of the estate of Ralph H. Orthwein, deceased, N. L. Noteman, Charles A. Sargeant, E. R. Pillars, J. S. Stevens, Walter R. Kuhn and Catherine O. Grau, executors of the estate of W. H. H. Childs, deceased, Anna Kramer, Zackary Miller, L. K. Cone, Wendel Andreas, E. R. Newland, H. S. Thomas, John Lochrie, Henry Bogaards, John Patton, Gleason Wood, Sophia Hillenbrand and Fletcher Trust Company, executors of the estate of George M. Hillenbrand, deceased, R. Guastavino, C. T. Lassen, H. C. Saltonstall, W. S. Leeds, Rosa T. Ludvigh, executrix of the estate of Clif-

ford G. Ludvigh, deceased, William B. Guerard, Stewart Raynor, George A. Dobyne, J. Wesley Pape, McCoy Brothers Indian River Navigation Company, William Stevens, Theophilus de Mott, Albert Park, A. H. Bower and Harry B. Rampe, the sum of \$1737.41, his costs as taxed, which sums shall bear interest from the date of the entry of this final decree until paid and that said respondent Phipps have execution therefor; and it is further

Ordered, Adjudged and Decreed that the petition of respondent Pilkington against respondent Phipps be, and the same hereby is, dismissed; and it is further

Ordered that unless this decree is satisfied or an appeal is taken within thirty (30) days after service of a copy thereof, with notice of entry upon the proctors for libelants, the stipulators for costs on behalf of libelants shall cause the engagement of their stipulation to be performed, or execution may issue against their goods and chattels, lands and tenements or other real estate to satisfy this final decree.

(Signed) JOHN W. HOLLAND,
United States District Judge.

On September 17th, 1941, a Stipulation and Order was filed amending the Final Decree of June 19th, 1941, which is in words and figures as follows:

4806.

STIPULATION AND ORDER.

(Title Omitted.)

Inasmuch as H. N. Hollinger was made a party libelant in this cause by order of Court dated May 9, 1939, and in the preparation of the Final Decree this was overlooked

and his name inadvertently was omitted as one of the parties whose libel was dismissed.

It is Stipulated that the Final Decree of June 19, 1941 may be amended so as to include the said H. N. Hollinger as a party libelant and dismiss his libel in like manner as the libels of the parties named in the Decree of June 19, 1941 were dismissed.

Dated this September 12, 1941:

BIGHAM, ENGLAR, JONES &
HOUSTON,

BATCHELOR & DYER,

Proctors for Libelants.

FRED BOTTS,

Proctor for Respondent

Pilkington.

BURLINGHAM, VEEDER,

CLARK & HUPPER,

LOFTIN, CALKINS, ANDER-
SON & SCOTT,

Proctors for Respondent

Phipps.

Upon the foregoing stipulation, It is Ordered that the Final Decree of June 19, 1941, be and it is hereby amended so as to include H. N. Hollinger who was made a party libelant by Order of May 9, 1939, and that the libel of the said H. N. Hollinger be, and it is hereby, dismissed in like manner as were the libels of the parties named in the Final Decree of June 19, 1941.

Done and Ordered at Tampa, Florida, this 16th day of September, 1941.

WILLIAM J. BARKER,

District Judge.

On September 17th, 1941, an Order of Court was filed substituting certain Libelants, which is in words and figures as follows:

4808

ORDER.

(Title Omitted.)

By consent of proctors for the libelants and the respondents, as shown by the stipulation filed in the papers of this cause, and it appearing therefrom that L. K. Cone, one of the libelants, having died, and Mrs. L. K. Cone having qualified as his executrix; and that Stewart Raynor, one of the libelants, having died and Edna M. Raynor having qualified as his executrix; and that J. H. Bauer, one of the libelants, was named as J. H. Bower, the same being a typographical error; and that William P. Guerard, one of the libelants, was named as William B. Guerard, the same being a typographical error; and that Gertrude Brandt Orthwein, as executrix, was substituted as a libelant by amendment dated March 15, 1939, Ralph H. Orthwein, the original libelant, having died and she having qualified as such executrix; and she having subsequently remarried so that her present name is Gertrude Brandt Orthwein Cave; and that Walter R. Kuhn and Catherine O. Childs, as executors, were substituted as libelants by amendment dated March 15, 1939, W. H. H. Childs, the original libelant, having died and they having qualified as such executors, and Catherine O. Childs having subsequently remarried so that her present name is Catherine O. Grau;

It is Thereupon Ordered that the libel be and the same hereby is amended as hereinabove set forth.

It is Further Ordered that said substituted libelants are bound by all the proceedings and decrees heretofore had and made in this cause.

Done and Ordered this 16th day of September, A. D. 1941.

WILLIAM J. BARKER.
U. S. District Judge.

On September 17th, 1941, the libelants filed their Notice of Appeal, which is in words and figures as follows:

4810 NOTICE OF APPEAL.

(Title Omitted.)

To: Burlingham, Veeder, Clark & Hupper, and Loftin, Calkins, Anderson & Scott, Proctors for Respondent Phipps;

Botts & Field, Proctors for, respondent Pilkington.

Sirs:

Please take notice that the libelants in the above entitled cause hereby appeal to the United States Circuit Court of Appeals for the Fifth Circuit from the final decree entered herein on the 19th day of June, A. D. 1941, and from each and every part of said decree.

Dated this 12th day of September, A. D. 1941.

BIGHAM, ENGLAR, JONES &
HOUSTON,
BATCHELOR & DYER,
LEONARD J. MATTESON,

By DAVID W. DYER,
Proctors for Libelants.

Acknowledged and accepted this 15 day of September,
A. D. 1941.

BURLINGHAM, VEEDER,
CLARK & HUPPER,
LOFTIN, CALKINS, ANDER-
SON & SCOTT,

By ROBERT H. ANDERSON,
Proctors for Respondent
John S. Phipps.

BOTTS AND FIELD,
By FRED BOTTS,
Proctors for Respondent,
George J. Pilkington.

On September 17th, 1941, libelants filed their Petition
for Appeal, which is in words and figures as follows:

4812

PETITION FOR APPEAL.

(Title Omitted.)

The undernamed libelants and Indemnity Insurance
Company of North America, their surety, considering
themselves aggrieved by the final decree made and en-
tered in this cause on or about June 19, 1941, hereby ap-
peal from the said decision and decree to the United
States Circuit Court of Appeals for the Fifth Circuit, and
file herewith their assignment of errors as required by
law, and thereupon pray that said appeal may be allowed
and that a transcript of the record, testimony, proceed-
ings and papers on which said final decree was made may
be sent up, duly authenticated, to the said United States
Circuit Court of Appeals for the Fifth Circuit at New

Orleans, Louisiana, and that a citation in due form be issued, citing the respondents, John S. Phipps and George J. Pilkington, to appear in answer to said appeal.

CHARLES CORYELL;
 JULIEN J. MARKS;
 J. FRANK GUYTON;
 J. M. FRERE;
 FRANK VOGT;
 WILLIAM A. and DOROTHY
 M. CASSIDY;
 LEON SIGMAN;
 THE UNION SAVINGS &
 TRUST COMPANY OF WAR-
 REN, OHIO,

As Trustee;

GERTRUDE BRANDT ORTH-
 WEIN CAVE,

As Executrix of the Estate
 of Ralph R. Orthwein, De-
 ceased;

N. L. NOTEMAN;
 CHARLES A. SARGEANT;
 J. S. STEVENS;
 WALTER R. KUHN and CATH-
 ERINE O. GRAU,

As Executors of the Estate
 of W. H. H. Childs, De-
 ceased;

MRS. L. K. CONE,

As Executrix of the Estate of
 L. K. Cone; Deceased;

WENDELL ANDREAS;
 E. R. NEWLAND;
 H. S. THOMAS;
 CATHLEEN LOCHRIE;
 D. T. PRICE,

ROBERT B. LOCHRIE,
CATHLEEN BOOZ and
MINNIE DICKEY,

As Executors of the Last Will
and Testament of John

Lochrie, Deceased;

HENRY BOGAARDS;

JOHN PATTON;

GLEASON WOOD;

SOPHIA HILLENBRAND and
FLETCHER TRUST COMPANY,

Executors of the Estate of
George M. Hillenbrand, De-
ceased;

R. GUASTAVINO;

C. T. LASSEN;

H. C. SALTONSTALL;

W. S. LEEDS;

ROSE T. LUDVIGH,

Executrix of the Estate of Clif-
ford G. Ludvigh, Deceased;

WILLIAM P. GUERARD;

EDNA M. RAYNOR,

As Executrix of the Estate of
Stewart Raynor, Deceased;

GEORGE A. DOBYNE;

J. WESLEY PAPE;

McCOY BROTHERS INDIAN
RIVER NAVIGATION COM-
PANY;

J. H. BAUER;

WILLIAM STEVENS;

THEOPHILUS de MOTT;

H. A. HOLLINGER;

HARRY B. RAMPE;

E. R. PILLARS;

Libelants,

By BIGHAM, ENGLAR, JONES &
HOUSTON and

BATCHELOR & DYER,

Their Proctors.

DAVID W. DYER,

By LEONARD J. MATTESON.

Dated this 12th day of September, A. D. 1941, at Miami,
Dade County, Florida.

Receipt of a true copy of the foregoing Petition for Ap-
peal is hereby acknowledged this 15 day of September,
1941.

BURLINGHAM, VEEDER,

CLARK & HUPPER and

LOFTIN, CALKINS, ANDER-

SON & SCOTT,

By ROBERT H. ANDERSON,

Proctors for Respondent John

S. Phipps.

BOTTS & FIELD,

By FRED BOTTS,

Proctors for Respondent

George J. Pilkington.

On September 17th, 1941, an Order of Court was filed
allowing an apepal, which is in words and figures as fol-
lows:

4814

ORDER ALLOWING APPEAL.

(Title Omitted.)

The above named libelants having filed herein their No-
tice of Appeal from the final decree and judgment entered

thereon on the 19th day of June, A. D. 1941, now on petition of Bigham, Englar, Jones & Houston, and Batchelor & Dyer, proctors for petitioners, it is

Ordered that an appeal to the United States Circuit Court of Appeals for the Fifth Circuit from the final decree and judgment thereon heretofore entered herein be and the same is hereby allowed, and that a certified transcript of the record be forwarded to the United States Circuit Court of Appeals for the Fifth Circuit, at New Orleans, Louisiana.

Done and Ordered this 16th day of September, A. D. 1941

WILLIAM J. BARKER,
U. S. District Judge.

On September 17th, 1941, the libelants filed their Assignment of Errors, which is in words and figures as follows:

4815

ASSIGNMENT OF ERRORS.

(Title Omitted.)

The libelants assign error to the decision and decree of the United States District Court for the Southern District of Florida, Miami Division, as follows: The Court erred—

1. In entering a decree in favor of the respondent John S. Phipps dismissing the libel.
2. In failing to hold that the respondent John S. Phipps is liable to the libelants for the damage sustained by their various vessels as described in the libel.

3. In failing to grant an interlocutory decree to the libelants against the respondent John S. Phipps.

4. In holding that there was no negligence on the part of respondent Phipps or any person for whose acts or omissions he was responsible.

5. In failing to hold that the respondent John S. Phipps operated and controlled the yacht "Seminole".

6. In holding that the corporation Seminole Boat Company stands as a non-conductor between the libelants and Pilkington on the one hand, and the respondent John S. Phipps as stockholder on the other.

7. In holding that the corporation Seminole Boat Company was not to be regarded as sham or fiction or agent of the respondent John S. Phipps but as a legal non-conductor between the respondent Phipps on the one hand, and the libelants and Pilkington on the other, because there was no fraud or other improper conduct or purpose in the creation or continued existence of the corporation.

8. In holding that the yacht "Seminole" was owned, operated, controlled and maintained by Seminole Boat Company, not respondent Phipps, and respondent Phipps is not liable for any acts or omissions of the Seminole Boat Company, or any person who acted on its behalf.

9. In holding that while the corporation made no profits and no charter after 1930, it continued in existence as a bona fide corporation and that there was no fraud or other reason to disregard the corporate entity, pierce the corporate veil or regard the corporation Seminole Boat Company as an agent of either of its stockholders.

10. In failing to hold, on the undisputed testimony, that the corporation, Seminole Boat Company, was the alter ego, corporate agent or corporate instrumentality of its two stockholders, the respondent John S. Phipps and his brother H. C. Phipps (and later of his sister Mrs. Amy Guest who acquired the interest of H. C. Phipps) because

(a) The corporation was merely an instrumentality through which the stockholders acted.

(b) Because the actions of the corporation were dominated and controlled by the stockholders to the extent that the corporation was a mere puppet.

(c) Because the officers of the corporation who were selected by the stockholders were the personal agents and servants of the stockholders, received no compensation from the corporation for the performance of their duties as such officers and accepted their offices and duties solely because of their obligations by reason of their relationship to the stockholders to attend to the personal business of the stockholders.

(d) The officers of the corporation had limited authority and were dominated and controlled in their actions by the stockholders.

(e) The corporation was not supplied with adequate capital to permit independent operation of the corporation by its officers and directors.

(f) The corporation did not charter the "Seminole" after April 1930, and had no bank account and no funds after June 2, 1931, that is, for approximately four years before the fire.

(g) The supposed transactions of the corporation both before and after the fire were in fact the personal transactions of the stockholders.

(h) Prior to June 2, 1931, the Seminole Boat Company was operated on funds advanced on the credit of the stockholders who also periodically made good the deficits incurred in the operation of the vessel. After June 2, 1931, the expenses of the "Seminole" which was in semi-permanent storage were paid by other Phipps corporations who were reimbursed directly by the stockholders for these expenditures and the so-called books of the Seminole Boat Company were a mere record of these transactions made up periodically sometime after the transactions had been completed.

(i) At the time of the fire on June 24, 1935, the corporation Seminole Boat Company was dormant, if not defunct.

(j) The transfer of legal title to the yacht "Seminole" by the stockholders of the corporation was nominal only and the stockholders particularly the respondent John S. Phipps did not part with the right to use the vessel and direct its use, and continued to deal with the yacht "Seminole" as their own vessel, and the respondent John S. Phipps did on various occasions use the yacht "Seminole" for his own purposes without any formal permission on the part of the corporation.

(k) The formation of the corporation made no substantial difference in the relationship of the stockholders or the respondent John S. Phipps to the vessel either in the payment of the expenses of the "Seminole" or in the use of the "Seminole" by the said respondent.

(1) The respondent John S. Phipps interfered directly, exercising authority in the management of the affairs of the corporation.

11. In failing to hold that the Seminole Boat Company cannot be a legal non-conductor or insulator against liability to the respondent John S. Phipps when the following circumstances exist:

(a) The respondent John S. Phipps owns 50% of the entire capital stock of the corporation which has been exchanged for his 50% interest in the vessel as former owner.

(b) The officers of the corporation and those to whom the management of the vessel is entrusted, receive no compensation for their services. They have no interest in the corporation or in the vessel. They accept and perform their functions as officers and directors of the corporation, solely because of their obligations to the shareholders, either as individuals, or as employees of other corporations owned by those shareholders, to attend to the personal business of the former owners of the vessel. They are persons who, by reason of the conditions of their general employment, are necessarily subject to the orders of the former owners.

(c) The purse strings of the corporation are tightly held by the former owners of the vessel to the extent that the corporation has no funds except those which are advanced or loaned to the corporation by the former owners of the vessel or are provided on their credit. The payment of the expenses of the vessel and of the corporation is dependent on such advances or on the reimbursement of disbursing corporations by the stockholders.

(d) The former owners of the vessel use the vessel for their personal purposes whenever they see fit.

(e) For approximately six and a half years the corporation has earned no profits but has incurred substantial and continuous deficits which would have forced the corporation out of existence except for the fact that the expenses of the vessel and of the corporation have been paid regularly by the stockholders.

(f) For more than five years the corporation has done no business and made no charter of the vessel and has had no income whatever.

(g) For four years the corporation has had no bank account and no funds and the expenses of the vessel have been paid by other corporations which have been reimbursed directly by the shareholders.

(h) For four years the vessel has been continuously laid up in storage except for four short periods. On three of these occasions the vessel was taken out of storage solely for the personal use of the respondent John S. Phipps, and on the fourth, for exhibition for sale, and for personal use of the respondent John S. Phipps.

(i) The officers of the corporation have been restricted in incurring expense on account of the vessel in that they were, in effect, spending the stockholders' money and knew that they were dependent upon the willingness of the stockholders to recognize and pay any debts and expenses incurred by them; consequently they were not at liberty to incur expense even for repairs and maintenance beyond small sums unless after consultation with the stockholders, they received specific approval from them, the stockholders thus controlling the purse strings of the corporation.

12. In failing to hold that when such conditions exist, the stockholders cannot rightfully and legally escape liability for negligence in the maintenance, upkeep and operation of the vessel and the results of their neglect, by reason of which the vessel has become dangerous, and this condition has led to a major disaster in which the property of many innocent persons has been destroyed.

13. In failing to hold that under such circumstances a Court of admiralty, pursuant to its duty to administer the broadest equity, will look through such transactions to ascertain the truth.

14. In failing to follow and apply the principles of admiralty and the decisions of the admiralty Courts in like cases.

15. In holding that under such circumstances, the stockholder of a corporately owned offending vessel will not be liable unless in a case of positive wrong or an act of positive negligence.

16. In failing to hold on the undisputed testimony that John F. Riley, who was appointed by the officers of the corporation in 1931 to take charge of the "Seminole" and to make regular inspections of the vessel, was the personal agent and servant of the respondent John S. Phipps, since

(a) John F. Riley, like the officers of the Seminole Boat Company, received no compensation from Seminole Boat Company for the performance of the duties assigned to him.

(b) He accepted those duties and undertook to perform them solely because of his relationship to the re-

respondent John S. Phipps and his obligation to attend to the personal business of the respondent, John S. Phipps in addition to the other duties performed for the said respondent without additional compensation.

17. In failing to hold that John F. Riley, as personal agent and servant of the respondent John S. Phipps was negligent in failing to make proper inspections of the yacht "Seminole" and was incompetent to make such inspections.

18. In failing to hold that the officers of the Seminole Boat Company, Scott, Hawkins and Alley, were personal agents and servants of the respondent John S. Phipps in the performance of their duties as such officers; were negligent in the performance of their duties in respect to the yacht "Seminole"; and had no qualifications or competence for the management of such a vessel as the "Seminole".

19. In failing to hold that Captain R. C. Abel was negligent in entering the engineroom of the "Seminole" on June 24, 1935 and lighting matches and closing openknife electric switches which were likely to cause sparks, although the danger of the presence of explosive gases was, or should have been, readily observable, and although Abel was specifically warned by his companion Thomas, also a boat captain, of the danger.

20. In failing to hold that Captain R. C. Abel when he entered the engineroom of the "Seminole" on June 24, 1935 and negligently performed acts which resulted in the explosion and subsequent fire was the personal agent and servant of the respondent John S. Phipps.

21. In failing to hold, in view of the conceded fact that Captain R. C. Abel was the general employee of the re-

spondent John S. Phipps that the respondent John S. Phipps failed to sustain the burden of showing that his general relation to Abel of master and servant had been suspended and a new like relation created between Abel and Seminole Boat Company on September 24, 1935, the day of the fire.

22. In finding that on June 24, 1935 Riley arranged for R. C. Abel to proceed to the "Seminole" on behalf of Seminole Boat Company and there to pay to Pilkington a small balance due from Seminole Boat Company to Pilkington on account of storage charges, to inspect the "Seminole", and to bring back certain property belonging to Seminole Boat Company.

23. In failing to hold that the negligence of Abel was a contributory cause of the explosion and fire.

24. In failing to hold that the respondent John S. Phipps is liable for the negligence of Abel.

25. In failing to hold that the respondent John S. Phipps is not entitled to limitation of his liability resulting from the negligence of his personal agent and servant Abel.

26. In failing to hold that the electric wiring system of the "Seminole" was defective and that the defective electric wiring on the "Seminole" was a contributory cause of the explosion.

27. In failing to hold specifically that the gasoline tanks of the "Seminole" were from the time of their installation improper, inadequate and unsafe for the storage of gasoline in a vessel of the type of the "Seminole" or any vessel.

28. In failing to hold that the existence of valves in the engineroom on the "Seminole" for the purpose of drawing off free gasoline in the engineroom of the "Seminole" from the tanks and gasoline supply system was an improper, unsafe and dangerous condition which had existed prior to the formation of the corporation by the respondent John S. Phipps who was then an active owner of the "Seminole", and which were permitted to exist down to the time of the fire.

29. In failing to hold that there was no adequate provision for the ventilation of the engineroom and tank compartments of the "Seminole".

30. In failing to hold that the existence of such serious defects leads to the natural inference that they were contributory causes of the explosion and fire.

31. In finding that the electric wiring of the yacht "Seminole" was placed in conduit or wire mold at Merrill Stevens Yard in 1927-8.

32. In failing to hold that John F. Riley and the officers of the corporation were negligent in failing to ventilate and make proper inspections of the "Seminole" and that such negligence is attributable to respondent John S. Phipps.

33. In failing to hold that the respondent John S. Phipps did not sustain the burden of showing freedom from privity and knowledge with respect to the defective and dangerous conditions of the "Seminole".

34. In failing to hold that the respondent John S. Phipps had privity and knowledge with respect to the defective and dangerous conditions of the "Seminole"—(a)

because the respondent John S. Phipps had personal knowledge of the dangerous and defective conditions on that vessel; (b) because the respondent John S. Phipps failed to appoint competent agents to manage the yacht "Seminole"; (c) because the respondent Phipps cannot shift his responsibility to agents of limited authority; (d) because the respondent Phipps is responsible for failure to provide a regular system of competent and adequate inspection; (e) because the respondent Phipps is chargeable with knowledge of the defective and dangerous conditions which could have been discovered by proper inspection; (f) because Riley, Alley, Scott and Hawkins were the alter ego of the respondent, John S. Phipps, and their negligence, knowledge and privity are his.

35. In finding that the presence of gasoline fumes in the engineroom was the sole cause of the fire and explosion which caused libelants' loss.

36. In finding that the respondent Phipps was not chargeable with negligence which was the proximate cause of libelants' loss.

37. In finding that the negligence which caused the loss of the "Seminole" was without the privity or knowledge of respondent Phipps.

38. In finding that the character of the negligence which caused the libelants' loss was of such a character as not to preclude respondent Phipps from asserting limitation of liability under 46 U. S. C. A. Sec. 183, Act of Congress of March 3, 1851, Sec. 8, Ch. 43, 9 Stat. 635.

39. In that after the Court found that with the passage of time some parts of the machinery or equipment of the

"Seminole" did leak, and that such leakage created danger of gasoline explosion in the engineroom of the "Seminole", the Court failed to hold respondent Phipps liable— (a) for failing to make proper and periodic inspections to ascertain the condition of the said machinery and equipment and thus prevent leakage; and (b) for permitting the yacht "Seminole" to be stored adjacent to crafts belonging to libelants when the machinery and equipment of the said yacht "Seminole" was in said dangerous condition.

40. In holding that respondent Phipps was not liable to respondent Pilkington.

41. In holding that respondent Pilkington was not liable to libelants.

42. In finding that the yacht "Seminole" was stored with the respondent Pilkington on an implied contract with Seminole Boat Company and that respondent Pilkington did not rely upon any warranty or representation.

43. In failing to find that the yacht "Seminole" was stored with the respondent Pilkington under a contract between the respondent John S. Phipps and the respondent Pilkington and that the respondent Phipps impliedly represented and warranted that the yacht "Seminole" was in a safe condition for storage in the covered yacht basin of the respondent Pilkington together with libelants' vessels and that respondent Pilkington relied on such representation and warranty.

44. In holding that the six months limitation of time in the Act of June 5, 1936 is not applicable to the defense of limitation of liability raised by the respondent John

S. Phipps by amendment to his answer on March 10, 1937, more than six months after June 5, 1936.

BIGHAM, ENGLAR, JONES &
HOUSTON,
BATCHELOR & DYER,
DAVID W. DYER,

By LEONARD J. MATTESON,
Proctors for Libelants-
Appellants.

Miami, Florida, September 12th, 1941.

To: Burlingham, Veeder, Clark & Hupper, Loftin, Calkins, Anderson & Scott, Proctors for respondent-appellee John S. Phipps.

Botts & Field, Proctors for respondent-appellee George J. Pilkington.

Service of above Assignment of Errors and receipt of copy thereof hereby acknowledged this 17 day of September, A. D. 1941.

LOFTIN, CALKINS, ANDER-
SON & SCOTT,

Proctors for Respondent
Phipps.

FRED BOTTS,

Proctors for Respondent
Pilkington.

On October 15th, 1941, the Court filed its order extending the return date in the Citation, which is in words and figures as follows:

4830

ORDER.

(Title Omitted.)

By consent of proctors for libelants and respondents, as shown by the stipulation filed in the papers of this cause on the 15th day of October, 1941,

It is Hereby Ordered that the return date in the Citation, towit, October 16, 1941, be and the same hereby is extended to and including November 1, 1941:

Done and Ordered at Miami, Florida, this 15th day of October, A. D. 1941.

JOHN W. HOLLAND,

United States District Judge.

On Nov. 1st, 1941, the Court filed its order extending the return date in the Citation, which is in words and figures as follows:

4831

ORDER.

(Title Omitted.)

By consent of proctors for libelants and respondents as shown by the stipulation filed in the papers of this cause on the 31st day of October, 1941,

It is Hereby Ordered that the return date in the Citation; towit, October 16, 1941, be and the same hereby is extended to and including December 1, 1941.

Done and Ordered at Miami, Florida, this 31st day of October, A. D. 1941.

JOHN W. HOLLAND,
District Judge.

On November 28th, 1941, the Court filed its order extending the return date in the Citation, which is in words and figures as follows:

4832

ORDER.

(Title Omitted.)

By consent of proctors for libelants and respondents, as shown by the stipulation filed in the papers of this cause on the 26th day of November, 1941,

It is Ordered that the return date in the Citation, towit, October 16, 1941, be and the same hereby is extended to and including the 20th day of December, 1941.

Done and Ordered at Miami, Florida, this 28th day of November, A. D. 1941.

JOHN W. HOLLAND,
District Judge.

On Nov. 28, 1941, a stipulation was filed as to settling and correcting the record and omitting certain exhibits, which is in words and figures as follows:

(Title Omitted.)

The libelants having appealed to the United States Circuit Court of Appeals for the Fifth Circuit from the final decree entered herein on or about June 19, 1941 dismissing the libel, and the parties having agreed upon the omission of certain portions of the testimony and evidence from the transcript of record to be certified by the Clerk for the purpose of this appeal on the terms and conditions hereinafter set forth, it is now

Hereby Stipulated and Agreed between the parties hereto that for all purposes in this case the following are facts:

When, on the morning of June 24, 1935, R. C. Abel purchased the gasoline represented by the purchase slip marked Exhibit S, he wrote on the purchase slip, Exhibit S, his signature, "R. C. Abel", and the words "Seminole Boat Co.", appearing immediately below the same.

And It is Further Hereby Stipulated and Agreed that no question of the authenticity or genuineness of the gasoline slip, Exhibit S, or any of the writing thereon, will hereafter be raised in this case.

In consideration of the foregoing stipulation, it is further stipulated and agreed:

(1) That the portions of the transcript of the record of the trial in the District Court, set forth in the attached Schedule A, be omitted by the Clerk from the record to be transmitted to the United States Circuit Court of Appeals for the Fifth Circuit;

(2) That the corrections set forth in the attached Schedule B shall be made in the transcript of the testimony at the trial; and

(3) That the exhibits listed in the attached Schedule C and no others shall be included by the Clerk in the record to be transmitted to the United States Circuit Court of Appeals for the Fifth Circuit; and that the Clerk shall certify the record, with the omissions and corrections as aforesaid as the complete transcript of record in this case.

Dated: November 28th, 1941.

BIGHAM, ENGLAR, JONES &
HOUSTON,

BATCHELOR & DYER,

Proctors for Libelants.

FRED BOTTS,

Proctors for Respondent

George J. Pilkington.

LOFTIN, CALKINS, ANDER-
SON & SCOTT,

Proctors for Respondent,

John S. Phipps.

Schedule A:

Testimony To Be Omitted From The Record On Appeal.

1. Omit preliminary statements and colloquy pages i to xii with the following exceptions:

(a) Page vii beginning 7th line from the bottom to page x end of line 6th.

(b) Page x beginning 10th line from the bottom through page xii:

2. Page 3, omit beginning "there" 3rd line from the bottom through "required" page 4, line 15.

3. Page 78:

(a) Beginning line 7 through page 79, line 2.

(b) Omit page 79, lines 4, 5 and 6.

(c) Omit page 79, line 12, through page 80, line 7.

4. Page 170, omit from top through 8th line from bottom.

5. Page 196, omit beginning line 8 through line 3, page 198.

6. Page 270, omit beginning line 7, through line 4th from the bottom.

7. Page 284, omit line 15 through line 2, page 285.

8. Page 385, omit beginning line 6 through line 18.

9. Page 404, omit beginning line 11 through line 12, page 407.

10. Page 410, omit beginning line 3 through line 6th from the bottom.

11. Page 414, omit beginning line 3 through page 415, line 11.

12. Page 425, omit parenthesis, four lines, beginning line 5.

13. Page 426, omit beginning line 5 through page 429, line 7.

14. Page 526, omit beginning line 8 through page 527, line 5th from bottom.

15. Page 578, omit line 8 beginning with the word "and" through page 583.

16. Page 584, omit beginning line 2, beginning with the word "but" through line 7th.

17. Page 584, omit line 13 beginning with word "and" through line 19.

18. Page 584, omit direct and cross-examination of Joseph F. Anderson through page 598, including Libelants' Exhibit 36.

19. Page 611, omit beginning line 3 through line 13.

20. Page 611, line 14, omit beginning "I" through "Matteson".

21. Page 630, line 15, omit beginning word "I" through page 633, line 4.

22. Page 642, omit beginning last line through page 643, 8th line from bottom; also last two lines.

23. Page 754, omit beginning line 6th from bottom through page 759, line 5.

24. Page 791, omit beginning line 9 through page 795, line 9.

25. Page 894, omit beginning line 5 through line 4th from the bottom.

26. Page 929, omit through page 932 (testimony of Wendel Andreas).

27. Page 1095 omit through page 1119 (testimony of John Cunningham, direct testimony incorporated in stipulation) except page 1100, line 6, through page 1101, line 4 to remain.

28. Page 1578, omit beginning line 15 "By Mr. Botts" through page 1584, line 5.

29. Page 1601, omit beginning line 7 "Mr. Botts" through page 1610, 7th line from the bottom.

30. Page 1624, omit beginning last line through page 1632, 3rd line from bottom.

31. Page 1755, omit beginning line 5 through page 1758.

32. Page 2138 through page 2150 omit testimony of Mae Abel.

33. Page 2151, line 3, through page 2186 omit entire testimony of G. B. Harkins beginning "Mr. Glenn Buren Harkins".

34. Pages 2593—2684 inclusive; page 2748—3028 inclusive, omit testimony of Charles F. Goddspeed, Elbridge W. Stein and Albert S. Osborn.

35. Page 3029 omit beginning line 5 through page 3030, line 2.

36. Page 3400 omit beginning line 7 through page 3407, line 4.

37. Page 3501, omit beginning 5th line from the bottom through page 3506, line 7.

Schedule B.

List Of Corrections In Transcript Of Testimony In Addition To Those Noted By Stenographer.

1. Page 6, line 6, change "bow" to "boat".
2. Page 13, after line 8, insert: "(By Mr. Underwood)".
3. Page 154, line 9 change "engine" to "Jenkins".
4. Page 155, 3rd line from bottom, strike out ";" insert "A".
5. Page 171, 2nd line from bottom change "Mr. Underwood" to "The Court".
6. Page 625, line 5, change "92" to "91".
7. Page 638, line 10, change "Bill" to "Abel".
8. Page 805, line 8 from bottom, strike out "no".
9. Page 956, line 3 after "have" insert "not".
10. Page 973, line 13, change "moisture or" to "musty".
11. Page 981, line 6, change "is a" to "in the".
12. Page 1134, line 7, change "no" to "yes".
13. Page 1806, line 8, change "any" to "only".
14. Page 1806, lines 20, 23, change "pail" to "bale".

Schedule C.

Libelants' Exhibits.

2. Valve and attached pipe.
3. Photograph of valve on #1 tank, etc.
4. Photograph of valve, close-up.
5. Photograph of valve, closer-up.
6. Photograph of four tanks.
7. Plan of Yacht Seminole.
8. Diagram, outline of Seminole.
9. Photograph of forward engineroom bulkhead and after tank compartment bulkhead.
10. Photograph of auxiliary light plant ahead of port main engine.
11. Two drain valves.
12. Photograph of engineroom from port side.
13. Gasoline can.
14. Funnel.
15. Photograph taken between two main engines, of forward engineroom bulkhead & auxiliary plant.
16. Photograph taken toward forward port side corner of engineroom, showing auxiliary light plant, etc.

17. Trap, from gasoline manifold line.
18. Part of knife-switch.
19. Photograph of carburetor of port engine, etc.
20. Photograph of light plant on port side of vessel.
21. Diagram of tanks on Seminole drawn by witness Holm.
22. Photograph of deck above engineroom.
24. 1937 Rules.
25. 1930 Set of Regulations.
26. Compilation of data with respect to gasoline explosions.
27. Lloyd's Register of American Yachts for 1933 (Duplicate #105).
28. Deposition of Carl Holm.
29. Deposition of E. D. Wright.
30. Consolidated Enrollment and Yacht License; Seminole; Miami, 4-18-'23.
31. Enrollment & Yacht License, Seminole; Miami, 11-5-'24.
32. Enrollment & Yacht License, Seminole; Miami, 2-16-'29.

33. Enrollment & Yacht License, Iolanthe, Miami, 7-7-'26.

36. Photograph of yacht basin after fire.

37. Photograph of yacht basin, with fire still burning.

38. Letter dated 2-11-'29, signed A. A. Simmon.

39. Letter dated 4-2-'29, signed Van E. Huff.

40. Letter dated 1-18-'32, signed Geo. J. Pilkington, to Palm Beach Company.

41. Letter dated 5-18-'32, signed by J. F. Riley.

42. Copy of letter dated 5-20-'32 to J. F. Riley.

43. Letter, 3-17-'33, signed Pilkington, to Mr. Riley.

44. Letter dated 4-26-'33, Pilkington to Palm Beach Company.

45. Copy of telegram dated 4-30-'33, Pilkington to J. S. Phipps.

46. Letter dated 3-20-'34, to Pilkington, signed Roy H. Andrews.

47. Letter dated 5-7-'34, signed Palm Beach Company, J. F. Riley.

48. Letter dated 9-5-'34, signed J. F. Riley.

49. Letter dated 8-26-'31, signed J. F. Riley.

50. Letter dated 9-13-'32, signed J. F. Riley.
51. Letter dated 12-1-'33, signed Palm Beach Co. by Roy H. Hawkins.
52. Letter dated 4-17-'35, signed Seminole Boat Co. by Roy H. Hawkins.
53. Letter dated 4-16-'35, signed J. F. Riley.
54. Letter dated 4-20-'35, signed Seminole Boat Co. by W. L. Webber.
55. Letter dated 1-21-'32, signed J. F. Riley.
56. Letter dated 3-21-'33, signed Riley.
57. Letter dated 5-3-'33, signed Riley.
- 58-A. Check, \$50.00, dated 6-10-'35.
- 58-B. Voucher, storage Seminole, May.
- 59-A. Check, \$10., dated 6-24-'35.
- 59-B. Voucher, accompanying.
60. Memorandum to Pilkington, signed J. F. Riley.
61. Letter, signed Geo. J. Pilkington.
62. Letter dated 9-30-'35 to Pilkington.
63. Sketch by witness Pilkington, showing berthing of boats, etc.
64. File, Seminole Boat Co., 1-1-'34 to 7-30-'35.

65. File, Seminole Boat Co., 1930-1933.
66. File, Seminole Boat, 1928-'29.
67. File, Seminole, 1925-1927.
68. Payrolls.
69. Payrolls.
70. Payrolls.
71. Payrolls.
72. Payrolls.
73. Payrolls.
74. Payrolls.
75. File of Palm Beach Co. vouchers.
76. Account Book of Seminole Boat Co.
77. File of Journal vouchers of Seminole Boat Co., numbered 1-22 with supports. (In evidence as Resp. Phipps' "Y".)
- 78**. File of Journal vouchers of Seminole Boat Co., numbered 23-103 with supports.
79. Stock certificate Book, Seminole Boat Co.
80. Minute Book, Seminole Boat Co.
81. Certificate of Incorporation of Seminole Boat Co.

82. Ledger; page 57 & index page "S" (1928).

83. (Ledger, pages 19 & 43 (1929).

84. Ledger, pages 52 & 53 (1930-31-32).

85. Ledger, pages 10, 11, 52, 53, 54 (1932-33).

86. Ledger pages 3 and 4 (1934).

87. Ledger, page 2 (1935).

88. List of Bills.

(**Libelants' #78 is in evidence as Resp. Phipps' "Z".)

89. List of checks.

90. Photostat of check, \$24.00.

91. Photograph, Seminole wreckage and tanks.

92. Photograph at basih, after fire.

93. Photograph, tanks of Seminole, etc., after fire.

94. Photograph, wreckage of Seminole and Blue Lagoon, after fire.

95. Typewritten memorandum of Thomas statement, prepared by McCoy.

96. Memorandum of Thomas statement.

97. Pamphlet, "Regulations governing marine hazards"

98. Photograph showing engineroom.

99. Diagram showing construction of tanks of Seminole.

100. Diagram of Mr. Underwood indicating tanks, bulkhead, lines, etc.

101. Rules for construction & classification, composite & steel yachts.

101-A. Rules for construction & classification, wood yachts.

104. Deposition of Ruth E. LeBar (and E. D. Wright).

105. Lloyd's Register (Duplicate #28).

106. Credit report.

108. Grocery list.

110. Drawing of switchboard (Schlappi).

111. Photograph.

112. Photograph.

113. Photograph showing rheostats.

114. Release.

118. Letter Simmon to Batchelor.

119. Letter Batchelor to Simmon.

120. Report by Bernard.

121, 122. Photostat of pamphlet, excerpt from Lloyd's Rules.

123. Sketch of valve (By Munroe).
133. Exhibit to A. J. Smith deposition; Exhibit "Story of the Natl. Fire Pro. Assn."
134. Exhibit to A. J. Smith deposition.
135. Exhibit to A. J. Smith deposition.
136. Exhibit to A. J. Smith deposition.
138. Encyclopedia excerpt (See No. 147).
139. Photograph of #4 tank showing side seam.
140. Photograph from #1 tank, across tank compartment.
141. Photograph in passageway looking forward to tank.
142. Photograph of tank compartment bulkhead, between Tanks 1 and 2.
143. Photograph of space where #4 tank was taken out.
144. Photograph from #2 tank across top of tank space.
145. Photograph from Float, looking at starboard side of boat.
146. Photograph of starboard side of Seminole showing tank & tank compartment.

147. Encyclopedia excerpt; typewritten copy (See No. 138).
148. Sketch by Thompson; partial diagram of Semi-hole.
149. Deposition of Andrew J. Smith.
150. Sketch by Thompson; doubling plate.
151. Sketch by Thompson; rivet and hole.
152. Photograph of part of crown plate #2 tank.
153. Photograph of tanks.
154. Photograph of side seam #2 tank.
155. Photograph of #3 tank.
156. Section of metal, side seam, tank #4.
157. Section of metal, side seam, tank #4.
158. Section of metal, side-wall & crown sheet, tank #4.
159. Section of metal, bottom of side wall, tank #4.
160. Section of metal, side-wall Tank #2.
161. Sketch by Gibbs, of caulking.
162. Sketch by Gibbs of caulking-tool.
163. Caulking tool.

164. Sample sections of steel plate.
165. Sketch by Thompson.
166. Sketch by Thompson.
167. Sketch by Thompson.
168. Sketch by Thompson.

Respondent Pilkington's Exhibits.

1. Check dated 8-12-'31, \$118.20, to Pilkington.
2. Bill.
3. ~~Bill~~
4. Check dated 5-21-'31, \$34.20.
5. Receipted bill, \$25.00 dated 4-30-'31.
6. Receipted bill, \$59.20, dated 4-30-'31.
11. Sketch (Witness Baker).
12. Sketch (Witness Simmon).
15. Sketch by Munroe, indicating caulking.
16. Photograph of tanks, Aug. 13, 1935.
17. Rivets.

Respondent Phipps' Exhibits.

1. Receipt for \$50.00.

2. Copy of report.

3. Regulations, 1930, N F P A.

A. Sketch or Plan of Seminole.

B. Photograph of Seminole.

D. Diagram showing construction of drain pans.

E. Letter dated 6-22-'34 signed Pilkington.

F. Letter dated 2-23-'35 to Pilkington.

G. Letter dated 6-13-'35 signed Pilkington.

H-1. Check, Seminole Boat Co.

H-2. Check, Seminole Boat Co.

H-3. Check, Seminole Boat Co. 2-11-'29.

H-4. Check, Seminole Boat Co. 4-24-'39.

H-5. Check, Seminole Boat Co. 9-11-'30.

H-6. Check, Seminole Boat Co. 11-4-'30.

H-7. Check, Seminole Boat Co. 12-5-'30.

H-8. Check, Seminole Boat Co. 12-31-'30.

I. Letter dated 7-5-'35 signed by Pilkington.

J-1. Face of check paid to Capt. Nelson.

J-2. Reverse of check paid to Capt. Nelson.

- K. File of 4 bills & 4 checks (Iolanthe).
- L. Portion of page showing outline of valve.
- M. Diagram of witness Patton showing sides & bottom of tanks, and drain valve.
- N. Diagram, plane view of bulkhead.
- O. Letter dated 7-31-'35 to Pilkington.
- P. Diagram of bottom of tank by witness Thompson.
- Q. Sketch of ground plug, by witness Thompson.
- R. Diagram of valve.
- S. Slip for purchase of gasoline by R. C. Abel.
- S-1. Duplicate of slip, Exhibit "S".
- T. Certificate of incorporation, Seminole Boat Co.
- U. Minute Book, Seminole Boat Co.
- V. Stock Book, Seminole Boat Co.
- W-1. Stock Cert. #4, Seminole Boat Co.
- W-2. Stock Cert. #6, Seminole Boat Co.
- W-3. Stock Cert. #8, Seminole Boat Co.
- X. Journal-Ledger, Seminole Boat Co.
- Y. File of checks & vouchers, Seminole Boat Co. (Libellants' #77 for identification).

Z. File of checks & vouchers, Seminole Boat Co. (Libelants' #78 for identification).

AA. Check book, Seminole Boat Co.

BB. Check-vouchers Seminole Boat Co.

CC. Contract, Seminole Boat Co. and Capt. Baker.

DD. Report of Capt. Bernard.

EE-1. Telegram to Capt. Baker.

EE-2. Telegram from Capt. Baker.

EE-3. Telegram to Capt. Baker.

FF. Letter 5-30-'32 to Pilkington.

GG. Voucher-check, personal property tax.

HH. Voucher-check, Capt. Abel.

II. Voucher-check employees & repairs.

JJ. Voucher-check Weinkle's.

KK. Voucher-check Miami Radio Service Co.

LL. Voucher-check, Bay Supply Co.

MM. Voucher-check, #299 to Kelly, Cashier.

NN. Voucher-check, Fla. East Coast Hotel Co.

OO. Voucher-check, Coconut Grove Boat Works.

- PP. Voucher-check, purchase of Prigg boat.
- QQ. Voucher-check, to Kelly, Cashier.
- RR. Voucher-check, Hamlyn Mattress Co.
- SS. Voucher-check, F. T. Budge Co.
- TT. Voucher-check, D. L. Reisner, Inc.
- UU. Voucher-check, Bernard.
- VV. Voucher-check, F. O. Pruitt, Inc.
- WW. Voucher-check, F. E. C. Hotel Co.
- XX. Voucher-check, Paul's Boat Sup. Co.
- YY. Voucher-check, Hamlyn Mattress Co.
- ZZ. Voucher-check, Kelly, Cashier.
- 3-A. Voucher-check, Biscayne Blvd. Co.
- 3-B. Voucher-check, Paul's Boat Sup. Co.
- 3-C. Voucher-check, Elect. Equipment Co.
- 3-D. Voucher-check, Edward Parkinson.
- 3-E. Voucher-check, Biscayne Blvd. Co.
- 3-F. Voucher-check, Hopkins-Carter Hardware Co.
- 3-G. Voucher-check, Capt. Baker.
- 3-H. Voucher-check, Bay Supply Co.

- 3-H-A. Charge slip of Bay Supply Co.
- 3-I. Voucher-check, No-Name Lodge.
- 3-J. Voucher-check, Southern Food Stores, Inc.
- 3-K-1. Letter from C. A. Weiss.
- 3-K-2. Same, enclosure.
- 3-L-1. Letter 1-30-'34 from Handley to Alley.
- 3-L-2. Copy of letter 1-30-'34, Handley to LeCount.
- 3-L-3. Balance sheets, Seminole Boat Co., 12-31-'33.
- 3-M. Photograph, after deck of Seminole.
- 3-N. Photograph, dining room of Seminole.
- 3-O. Charter of Seminole—E. J. Stehli.
- 3-P. Charter of Seminole—Ann Murdock.
- 3-Q. Insurance policy.
- 3-R-1. Chart of ownership.
- 3-R-2. Chart of ownership.
- 3-R-3. Chart of ownership.
- 3-S. List of accounts for which disbursements were made.
- 3-T-1. Vouchers & Bill.

3-T-2. Vouchers & Bill.

3-T-3. Vouchers & Bill.

3-T-4. Vouchers & Bill.

• 3-U. File of vouchers.

3-V. Checks & supporting data, etc.

3-W. Photograph.

3-X. Photograph.

3-Y. Photograph.

3-Z. Photograph.

4-A. Photograph.

4-B. Photograph.

4-C. Deposition, Anthony Schinigo.

4-D. Analysis of Anderson.

4-E. Letter 6-23-'31 & account Blvd. Mtg. Co. & Phipps Realty Co.

4-F. Check-voucher; Palm Beach Co.; \$200 charge of Capt. Bryant.

4-G. Blvd. Mtg. Co. voucher 350.

4-H. Letter 5-31-'35 from LeCount with statement Seminole Boat Co.

- 4-I. Orig. bill of Palm Beach Svc. Station, June 1935.
- 4-I-1. Check, J. S. Phipps, \$22.67.
- 4-I-2. Palm Beach Co. triplicate voucher \$2.19.
- 4-I-3. Check 8-9-'35.
- 4-I-4. Voucher 8499 (dup. copy).
- 4-J. Petcock.
- 4-K. Memo. OK'd by JSP.
- 4-L. File of bills.
- 4-M. Merrill-Stevens Dry Dock Co. bills.
- 4-N. Analysis.
- 4-O. Comparative statement by Simmon.
- 4-P. Photostat; ledger page, John S. Phipps.
- 4-Q. Photostat; ledger page, John S. Phipps.
- 4-R. Photostat; ledger page, John S. Phipps.
- 4-S. Photostat; ledger page, John S. Phipps.
- 4-T. Photostat; ledger page, H. C. Phipps.
- 4-U. Photostat; ledger page, H. C. Phipps.
- 4-V. Photostat; ledger page, H. C. Phipps.
- 4-W. Photostat; ledger page, Mrs. Guest.

4-X. Photostat; ledger page, H. C. Phipps.

4-Y. Photostat; ledger page H. C. Phipps.

4-Z. Photostat; ledger page, H. C. Phipps.

5-A-1. Photostat; ledger page, J. S. Phipps.

5-A-2. Photostat; ledger page, J. S. Phipps.

5-B-1. Photostat; ledger page, J. S. Phipps.

5-B-2. Photostat; ledger page, J. S. Phipps.

5-C-1. Photostat; ledger page, J. S. Phipps.

5-C-2. Photostat; ledger page, J. S. Phipps.

5-C-3. Photostat; ledger page, J. S. Phipps.

5-C-4. Photostat; ledger page, J. S. Phipps.

5-D. Photostat; ledger page, Mrs. Guest.

5-E. Analysis by Weiss.

5-F-1. Statement, 357.92.

5-F-2. Duplicate Voucher.

5-F-3. Check.

5-G-1. Check 1224.91.

5-G-2. Voucher.

5-G-3. Statement.

- 5-H-1. Check, 1224.90.
- 5-H-2. Duplicate voucher.
- 5-H-3. Statement.
- 5-I-1. Check, 2662.07.
- 5-I-2. Duplicate voucher.
- 5-I-3. Statement.
- 5-J. List of vessels and insurance companies.
- 5-J. Photograph of port end of tank compartment.
- 5-K. Photograph of tank compartment.
- 5-L. Photograph of tank compartment showing space between tanks and bulkhead.
- 5-T. Photograph of Exhibit #11.
- 5-U. Photograph of Exhibits 2 and 17.
- 5-V. Section of metal from #4 tank.
- 5-W. Section of metal from #4 tank.
- 5-X. Section of metal from #4 tank.
- 5-Y. Section of metal from #1 tank.
- 5-Z. Section of metal from #2 tank.
- 6-A. Section of metal from #3 tank.
- 6-B. Sketch by witness Thompson, of upper crown of tank.

On Dec. 13th, 1941, the Court filed its order directing the transmission of the original exhibits to the Clerk of the United States Circuit Court of Appeals for the Fifth Circuit, which is in words and figures as follows:

4855

ORDER.

(Title omitted.)

This matter coming on to be heard upon the stipulation of all the proctors for the respective parties, and it appearing to the Court that the nature of the exhibits in this cause precludes their incorporation in the transcript of record, upon consideration thereof

It is Ordered and Adjudged that the Clerk of the above entitled Court transmit to the Clerk of the United States Circuit Court of Appeals, Fifth Circuit, New Orleans, Louisiana, all the original exhibits designated in Schedule C attached to a stipulation as to the record dated November 28, 1941.

Done and Ordered at Miami, Florida, this 13th day of December, A. D. 1941.

JOHN W. HOLLAND,
United States District Judge.

On December 13th, 1941, libelants filed their Motion to include in the transcript the petition under the 56th Rule in Admiralty of Respondent George J. Pilkington, which is in words and figures as follows:

4856 **MOTION TO INCLUDE DOCUMENT IN
RECORD ON APPEAL.**

(Title Omitted.)

Come now the libelants above styled, and represent unto the Court that they have requested the clerk of this

Court to include in the transcript of record on appeal the petition under the 56th Rule in Admiralty of respondent George J. Pilkington against John S. Phipps; that respondent John S. Phipps has objected to the inclusion of said petition in said record.

Wherefore, libelants move this Court for an order determining whether said petition shall be included or omitted in said transcript of record on appeal.

BIGHAM, ENGLAR, JONES &
HOUSTON,
BATCHELOR & DYER,
By DAVID W. DYER,
Proctors for Libelants.

On December 13th, 1941, the Court entered its order the Motion to include Respondent Pilkington's petition under the 56th Rule in Admiralty in the transcript of record, which is in words and figures as follows:

**ORDER GRANTING MOTION TO INCLUDE DOCUMENT
IN RECORD ON APPEAL.**

4857

(Title Omitted.)

This cause coming on to be heard before me upon the motion of proctors for libelants for an order determining whether the petition under the 56th Rule in Admiralty of the respondent George J. Pilkington against respondent John S. Phipps shall be included or omitted in the transcript of record on appeal, and the same having been argued by proctors for the respective parties, and the Court being fully advised in the premises,

It is Ordered, Adjudged and Decreed that the petition under the 56th Rule in Admiralty of Respondent George J. Pilkington against respondent John S. Phipps be included in the transcript of record on appeal.

Done and Ordered at Miami, Florida, this 13th day of December, A. D. 1941.

JOHN W. HOLLAND,
District Judge.

4858

CLERK'S CERTIFICATE.

In the United States District Court in and for the Southern District of Florida, Miami Division.

Charles Coryell, et al., Libelants,

against

No. 122-M-Adm.

John S. Phipps and George J. Pilkington, Respondents.

I, EDWIN R. WILLIAMS, Clerk of the United States District Court in and for the Southern District of Florida, do hereby certify that the foregoing volumes, A, pages numbered 1 to 123, both inclusive, B, pages numbered 1 to 142, both inclusive, C, introductory pages and pages numbered 1 to 539, both inclusive, D, pages numbered 540 to 1152, both inclusive, E, pages numbered 1 to 46, both inclusive, F, pages numbered 1 to 82, both inclusive, G, pages numbered 1 to 63, both inclusive, H, pages numbered 1153 to 1907, both inclusive, I, pages numbered 1 to 33, both inclusive, J, pages numbered 1908 to 2439, both inclusive, K, pages 2440 to 3028, both inclusive, L, pages 3029 to 3612, both inclusive, M, pages 3613 to 4223, both inclusive, N, pages 1 to 159, both inclusive, O, pages 1 to 48, both inclusive, present a true, full and correct copy of the proceedings had, and orders entered, as therein stated, in

Case No. 122-M-Adm., wherein Charles Coryell, et al., were libelants and John S. Phipps and George J. Pilkington were respondents, as the same appears of record and on file in this office, said contents of record being agreed upon by stipulation of proctors for the respective parties and included within said transcript.

Witness my official signature, and the seal of said District Court, at my office in the City of Miami, State of Florida, this 15th day of December, A. D. 1941.

EDWIN R. WILLIAMS,

(Seal)

Clerk, United States District
Court, Southern District of
Florida,

By EARLE F. SPRIGG,
Deputy Clerk.

— — —

Citation omitted from the printed record, the original thereof being on file in the office of the Clerk of the U. S. Circuit Court of Appeals.

• • • • •

That thereafter the following proceedings were had in said cause in the United States Circuit Court of Appeals for the Fifth Circuit, viz:

ARGUMENT AND SUBMISSION

Extract from the Minutes of May 11th, 1942

No. 10185

CHARLES CORYELL, et al.,

versus

JOHN S. PHIPPS and GEORGE J. PILKINGTON

On this day this cause was called, and, after argument by Leonard J. Matteson, Esq., for appellants, and Eugene Underwood, Esq., for appellees, was submitted to the Court.

OPINION OF THE COURT—Filed June 9, 1942

IN THE
United States Circuit Court of Appeals
FOR THE FIFTH CIRCUIT

No. 10185

CHARLES CORYELL ET AL.,

Appellants,

versus

JOHN S. PHIPPS AND GEORGE J. PILKINGTON,

Appellees.

*Appeal from the District Court of the United States
for the Southern District of Florida.*

(June 9, 1942.)

Before SIBLEY, HOLMES, and McCORD,
Circuit Judges

HOLMES, Circuit Judge: The houseboat Seminole, while lying in dead storage in the yacht basin owned and operated by George Pilkington at Fort Lauderdale, Florida, caught fire following an explosion in her engine room. The fire spread to other vessels stored in the basin, and damaged or destroyed more than forty of them. Appellants, who were owners of vessels to which the fire spread, filed this libel against John S. Phipps (by whom the Seminole was alleged to be owned, operated, or controlled) and Pilkington (as

bailee of the vessels in the basin). to recover damages alleged to have been sustained by reason of the negligence of said defendants.

After a thorough trial in the court below, judgment was entered dismissing the libel as to both defendants. On this appeal therefrom, appellants disregard the respondent Pilkington, and concentrate their efforts upon reversing the judgment as to Phipps. It is contended that Phipps should have been held liable because, although the legal title to the houseboat was in the Seminole Boat Company, a Delaware corporation, the evidence clearly showed that Phipps was the actual owner and was in control and operation of the vessel, and that his negligent care of her, through his servants, was the proximate cause of the fire.

In 1915 Phipps acquired a one-half interest in the Seminole by purchase from his brother. In 1927 the boat was completely overhauled, and in 1928 the Phipps brothers organized the Seminole Boat Company, to which the boat was transferred in furtherance of the corporate purpose to enter the charter business for profit. The stockholders of the corporation held meetings, elected officers, kept minutes; and the corporation, through its duly elected officers, promptly took appropriate steps to launch the Seminole upon her career as a charter vessel. In 1929 and 1930 she was chartered several times, but she was too large and expensive to be operated successfully as a charter vessel during the following years of severe economic depression. As a consequence, she spent much of the time in dead storage at Pilkington's pier, and was listed for sale in Miami in 1935.

On March 23, 1935, H. C. Phipps sold his stock in the Seminole Boat Company to his sister, and, after the charter season was over in April, 1935, the two stockholders took the Seminole on a fishing trip to the Florida Keys.

After the cruise the Seminole was once more moved to Pilkington's, where she was prepared for storage by the crew and was turned over to Pilkington on April 15, 1935. It is undisputed that the vessel had been examined and pronounced fit by an experienced ship surveyor in February, 1935; that she developed no flaws during the cruise or prior to reaching Pilkington's; that the crew left her gasoline valves closed, her electric switches open, her gas tanks registering empty, and her bilges clean and free of gasoline or gasoline vapor; and that she was repeatedly examined by competent men between April 15 and June 24, 1935, who discovered nothing wrong with her. At all times after the title to the Seminole was transferred to the corporation her movements were directed by the officers of the corporation, she was manned by a crew employed by those officers, and all business dealings in connection with her operation and management were conducted by those officers.

On June 24, 1935, an officer of the Seminole Boat Company employed R. C. Abel to go to Pilkington's to inspect the Seminole and to bring back for storage some fishing gear that was on her. Abel obtained the keys to the boat from Pilkington, and boarded her in company with a man named Thomas. Abel entered the engine room through its window, and crossed to the main switchboard, where he struck a match and proceeded to close several of the switches. As he closed the last switch, sparks emanated from a point approximately a foot to his left, and an explosion occurred followed by the fire that caused the damage. After the fire a diver discovered that the gasoline valves and draw-off valves on the Seminole were open.

Upon these facts the court below found that the presence of gasoline fumes in the engine room was a defective condition that proximately caused the fire, but that the

negligence to which this condition was attributable was that of the Seminole Boat Company, which was not a party defendant to the suit; that the Seminole Boat Company was incorporated in good faith for a valid purpose, and no reason was shown to justify disregarding the corporate entity or treating it as agent and alter-ego of John S. Phipps; and that Phipps was not shown to have such privity or knowledge with respect to the defective condition as would make chargeable to him the negligence responsible for the loss.

The basic dispute turns upon the ultimate facts, for when they have been ascertained the principles of law applicable thereto are well settled. This being an appeal in admiralty, the findings of fact made by the court below are not binding upon us, but we think the evidence preponderates in favor of the findings made in each material instance. Under the evidence, the case presents itself in this aspect: Appellants' vessels sustained damages by reason of the negligence of the Seminole Boat Company. In order to hold Phipps to personal liability, appellants had the burden of establishing, by a preponderance of the evidence, that the corporation was an artifice and a sham designed to execute illegitimate purposes in abuse of the corporate fiction and the immunity that it carries, and that its activities in reality were those of Phipps personally.¹ This burden was not discharged.

If, however, appellants had established that the corporate veil should have been pierced and Phipps disclosed as the true owner of the vessel, an affirmance against them still would result. Section 4283 of the Revised Statutes, 46 U. S. C. A., Sec. 183, limits the individual

¹ *McCaskill Co. v. U. S.*, 216 U. S. 504, 514; *So. Pacific Terminal Co. v. Interstate Commerce Commission*, 219 U. S. 498; *Loomis v. Manhattan*, 117 Fed. 325; *U. S. v. Milwaukee, etc. Co.*, 142 Fed. 247; *New York Trust Co. v. Carpenter*, 250 Fed. 668; *Cook on Corporations*, Sections 6, 663, and 664; *Powell's Parent and Subsidiary Corporations*, page 2; *Wormser's The Disregard of the Corporate Fiction and Allied Corporate Problems*, page 84.

liability of any shipowner to the value of his interest in the vessel and freight in all cases of damage resulting from negligence without the privity or knowledge of the owner. The evidence affirmatively establishes that no actual privity to or knowledge of the defective condition obtaining upon the *Seminole* was attributable to Phipps personally, and that none could be imputed to him since he had exercised due care and diligence in selecting competent men to man the vessel, and had imposed upon them full duties as to inspection and maintenance of her.²

The judgment appealed from is

AFFIRMED.

² *Lord v. Goodall S. S. Co.*, Fed. Cas. No. 8,506, 102 U. S. 541; *The Annie Faxon*, 75 Fed. 312; *Van Eyken v. Erie R. Co.*, 117 Fed. 712; *The Tommy*, 151 Fed. 570; *The Aloha*, 228 Fed. 1006; *The Erie Lighter* 108, 250 Fed. 490; *The Oneida*, 282 Fed. 232; *The 84-H*, 296 Fed. 427, Cert. denied, 264 U. S. 596.

3650

JUDGMENT

Extract from the Minutes of June 9th, 1942

No. 10185

CHARLES CORYELL, et al.,

versus

JOHN S. PHIPPS and GEORGE J. PILKINGTON

This cause came on to be heard on the transcript of the record from the District Court of the United States for the Southern District of Florida, and was argued by counsel;

On consideration whereof, it is now here ordered, adjudged and decreed by this Court, that the judgment of the said District Court appealed from in this cause be, and the same is hereby, affirmed;

It is further ordered, adjudged and decreed that the appellants, Charles Coryell, and others, be condemned, in solido, to pay the costs of this cause in this Court, for which execution may be issued out of the said District Court.

MOTION AND ORDER STAYING MANDATE—Filed June 26, 1942
IN THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE
FIFTH CIRCUIT

No. 10185

CHARLES CORYELL, et al., Appellants,
against

JOHN S. PHIPPS and GEORGE J. PILKINGTON, Appellees

Now come the appellants, Charles Coryell, et al., and move this court on the transcript of record filed herein, on all proceedings had before this court, and on the decision and opinion of the court filed June 9, 1942, that the mandate of this court be stayed until after the decision of the United States Supreme Court on a petition for a writ of certiorari which the appellants propose to file in that court within the period limited by the statute and for such other and further relief as to the court may seem just.

Dated: New York, N. Y., June 22, 1942.

(Signed) T. Catesby Jones, Leonard J. Matteson,
Counsel for Appellants.

Bigham, Englar, Jones & Houston, Proctors for Libellants, Appellants, 99 John Street, New York, N. Y.

UNITED STATES CIRCUIT COURT OF APPEALS FOR THE FIFTH
DISTRICT

No. 10185

CHARLES CORYELL, et al., Appellants,

versus

JOHN S. PHIPPS and GEORGE J. PILKINGTON, Appellees

On consideration of the application of the appellants in the above numbered and entitled cause for a stay of the mandate of this court therein, to enable appellants to apply for and to obtain a writ of certiorari from the Supreme Court of the United States, it is ordered that the issue of the mandate of this court in said cause be and the same is stayed for a period of thirty days; the stay to continue in force until the final disposition of the case by the Supreme Court, provided that within thirty days from the date of this order there shall be filed with the clerk of this court the certificate of the clerk of the Supreme Court that certiorari petition, and record have been filed, and that due proof of service of notice thereof under Paragraph 3 of Rule 38 of the Supreme Court has been given. It is further ordered that the clerk shall issue the mandate upon the filing of a copy of an order of the Supreme Court denying the writ, or upon the expiration of thirty days from the date of this order, unless the above-mentioned certificate shall be filed with the clerk of this court within that time.

Done at New Orleans, La., this 26th day of June, 1942.

(Signed) Rufus E. Foster, United States Circuit
Judge.

Clerk's Certificate to foregoing transcript omitted in
printing.

SUPREME COURT OF THE UNITED STATES, OCTOBER TERM,
1942

No. 246

ORDER ALLOWING CERTIORARI—Filed October 12, 1942

The petition herein for a writ of certiorari to the United States Circuit Court of Appeals for the Fifth Circuit is granted.

And it is further ordered that the duly certified copy of the transcript of the proceedings below which accompanied the petition shall be treated as though filed in response to